

FIG.1

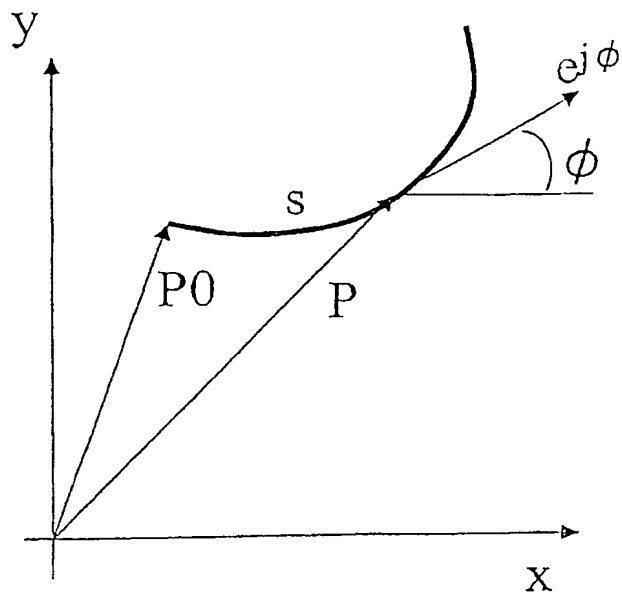


FIG.2

$$0 \leq S = \frac{s}{h} \leq 1$$

$$P(S) = P_0 + h \int_0^S (\cos \phi + j \sin \phi) dS$$

$$\phi(S) = \phi_0 + \phi v S + \phi u S^2$$

P0: COORDINATE OF STARTING POINT

ϕ : ANGLE MADE BETWEEN TANGENTIAL DIRECTION AND x-AXIS

h : CURVE LENGTH

s : DISTANCE MOVED FROM STARTING POINT

S : CURVE LENGTH VARIABLE

$\phi_0, \phi v, \phi u$: (const)

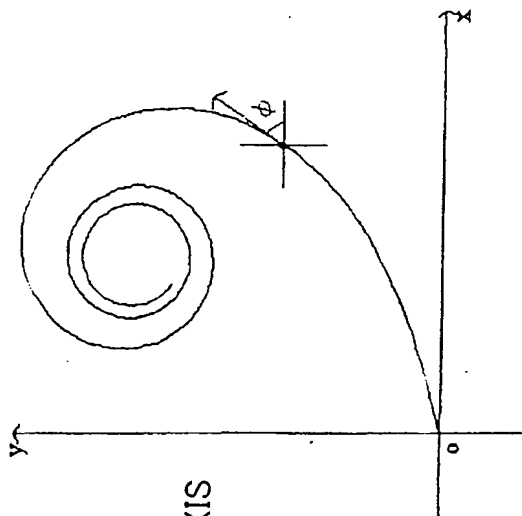


FIG.3

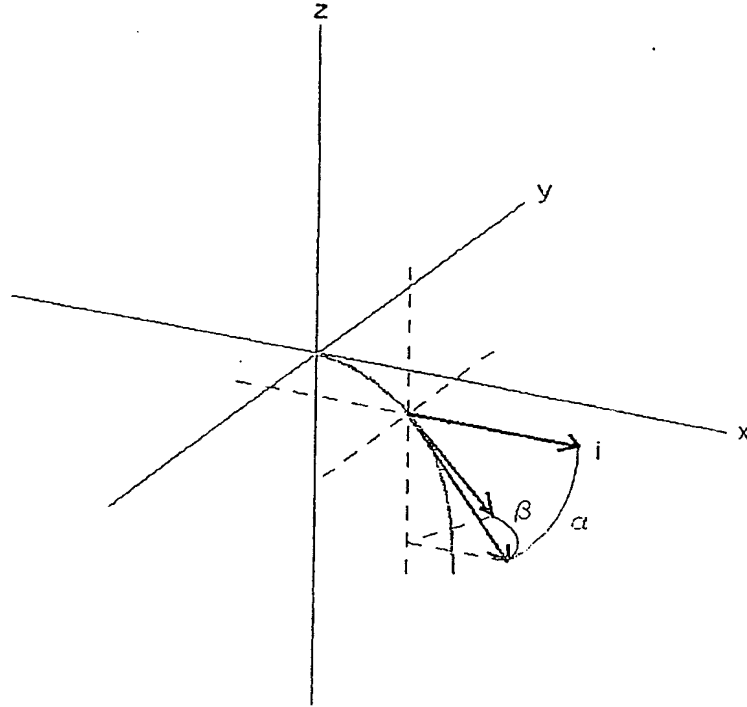


FIG.4

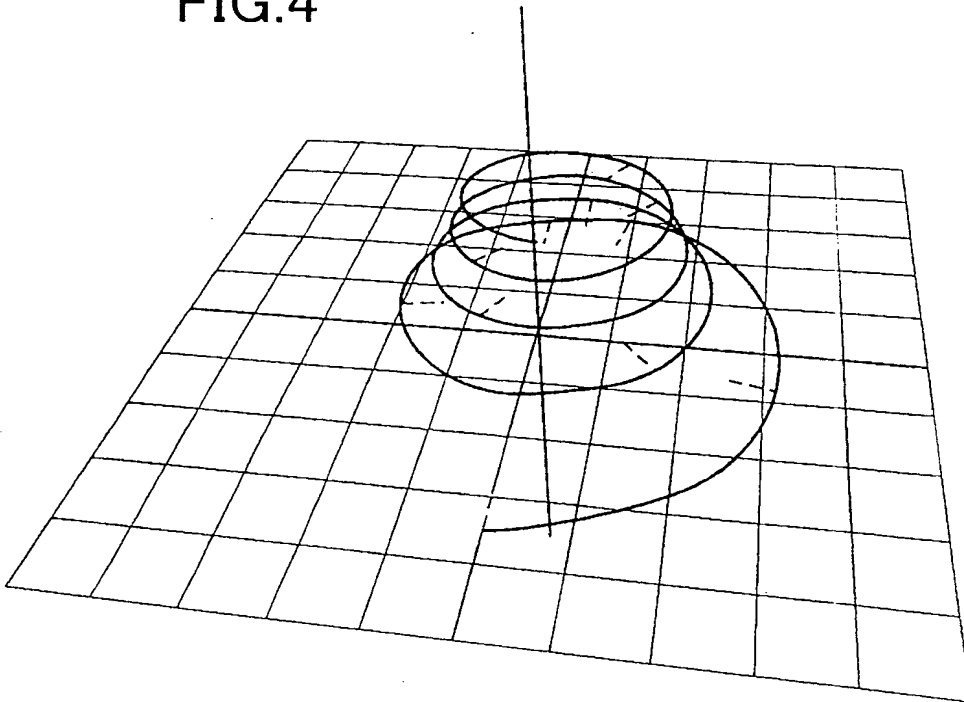


FIG.5

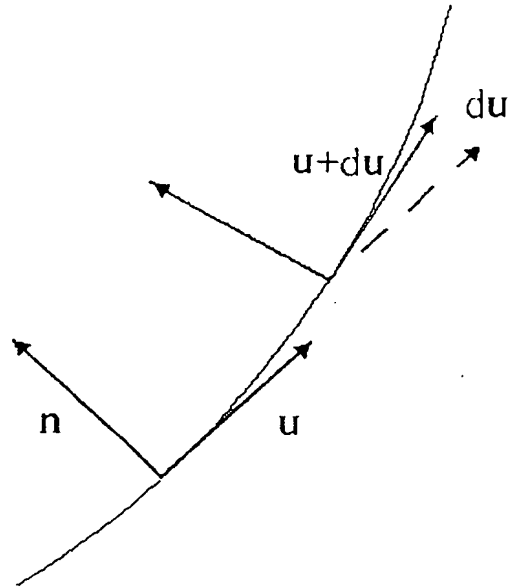


FIG.6

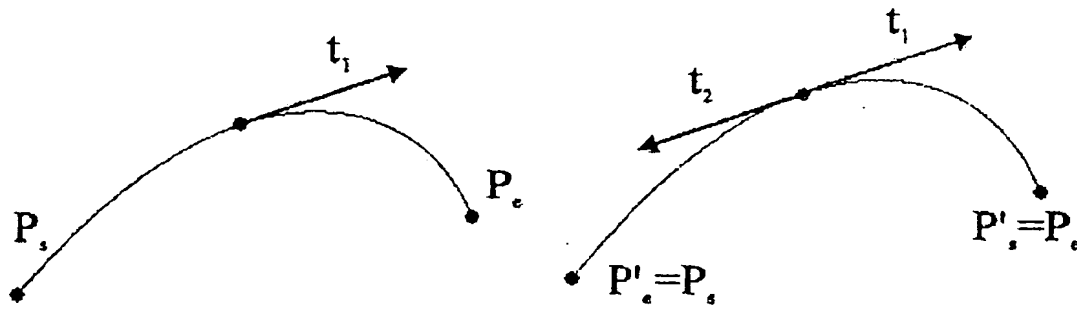


FIG.7

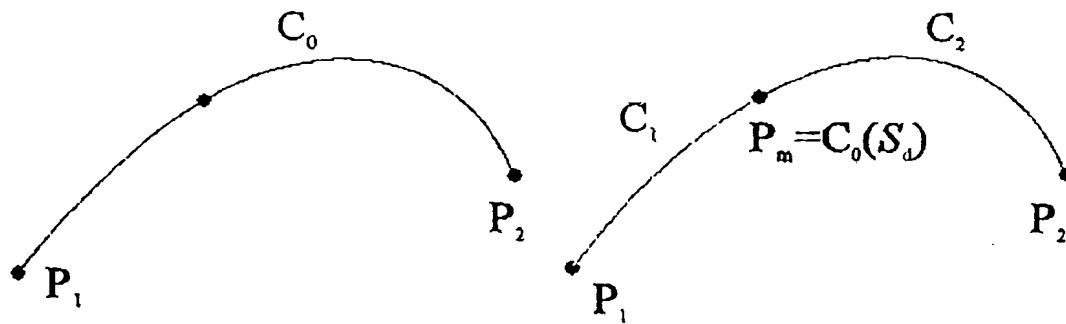


FIG.8

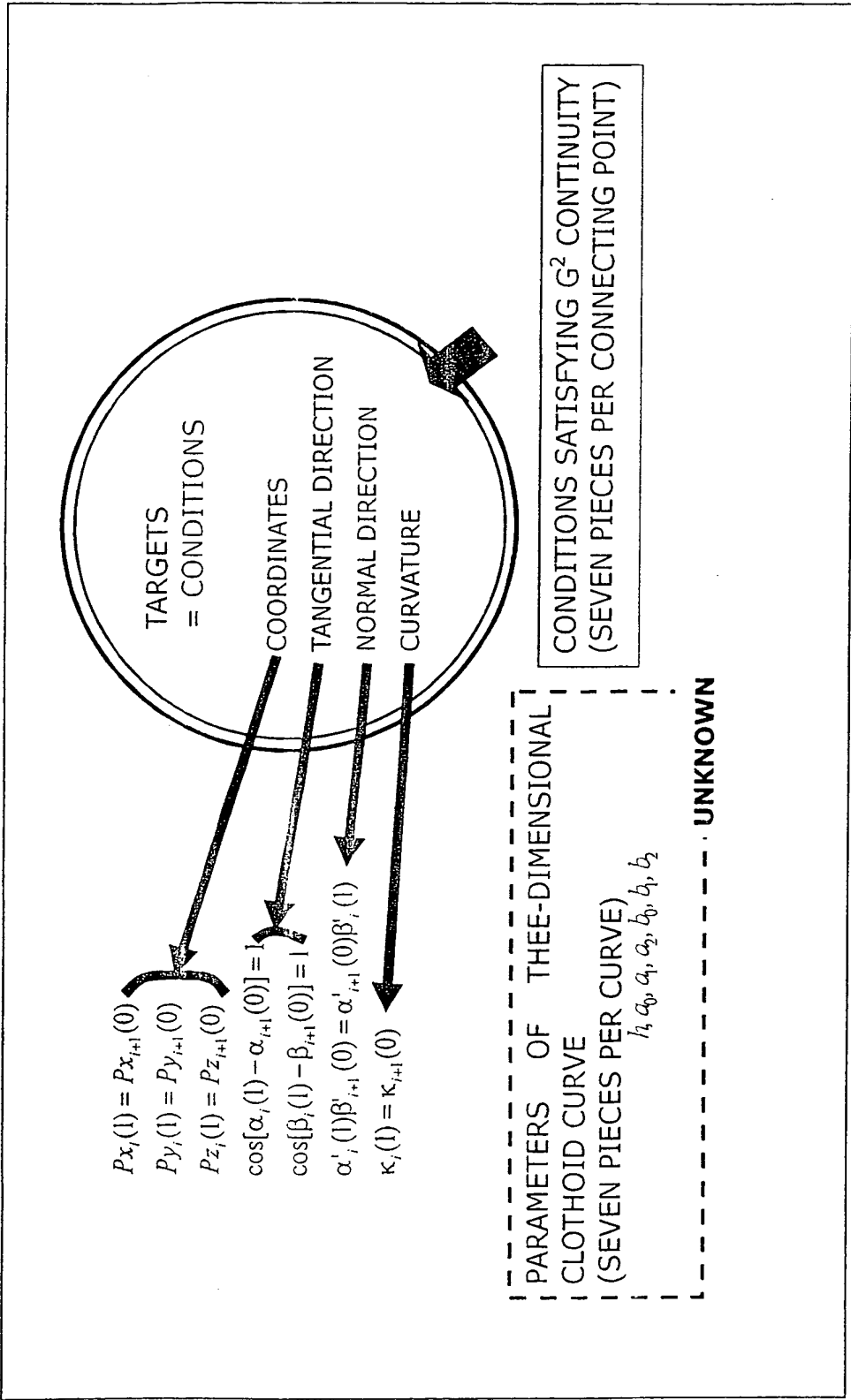


FIG.9

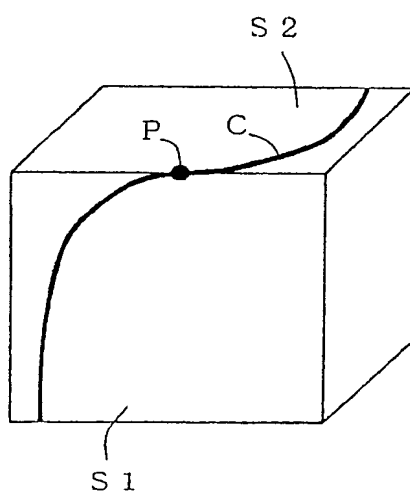


FIG.10

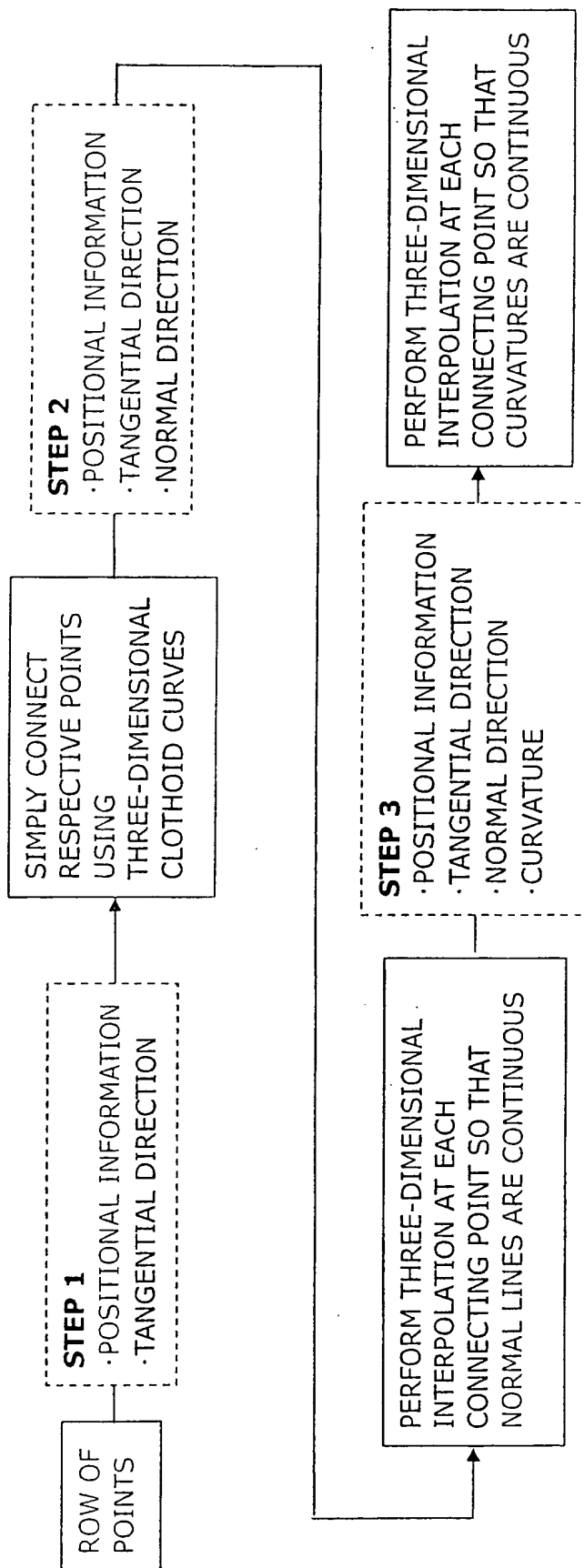


FIG.11

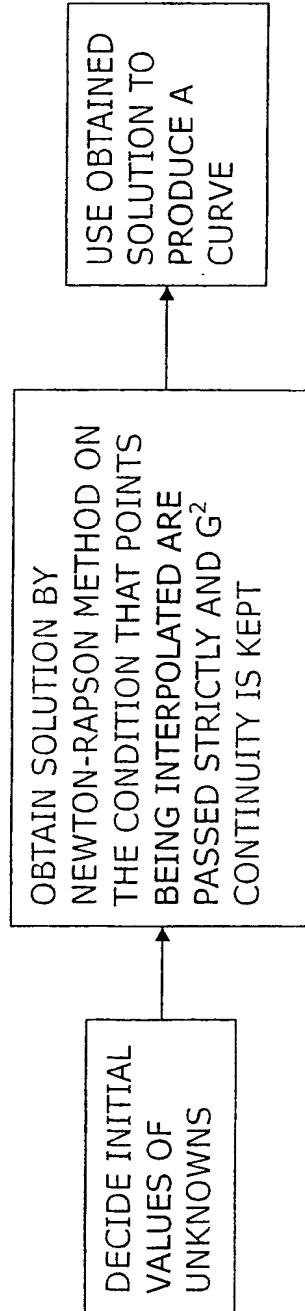


FIG.12

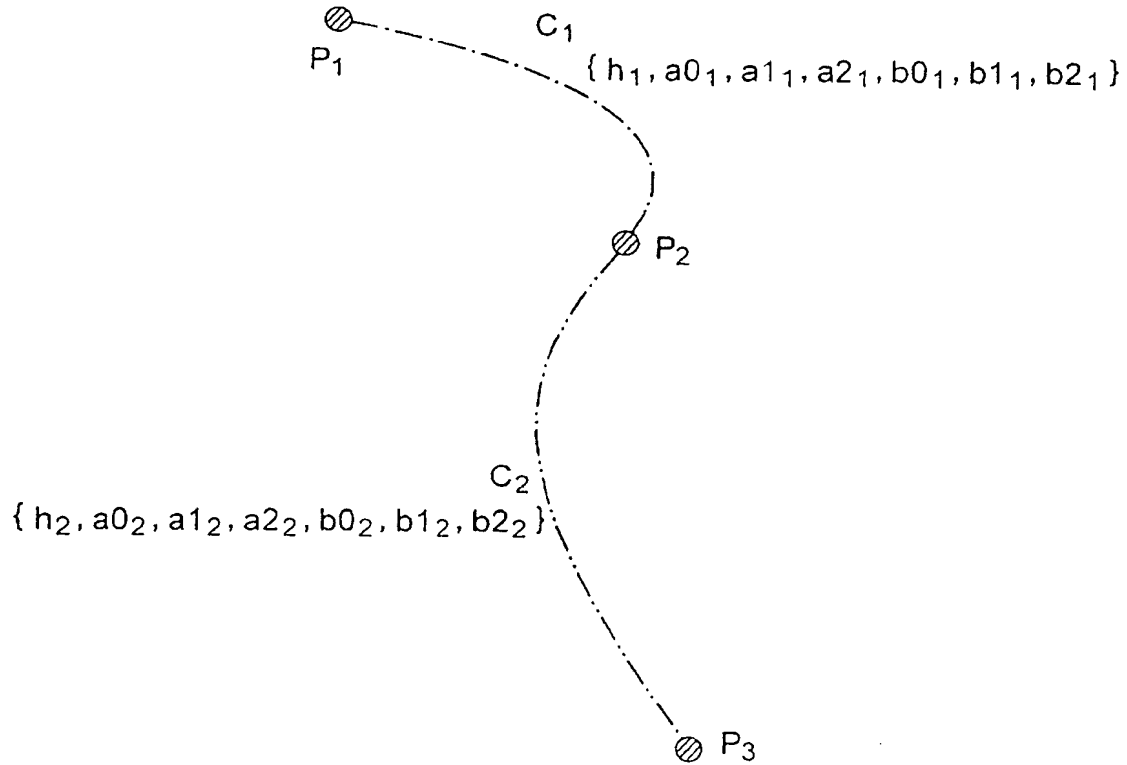


FIG.13

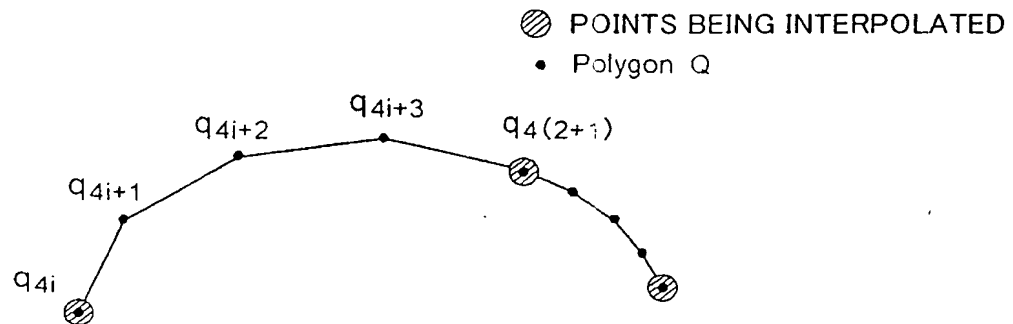
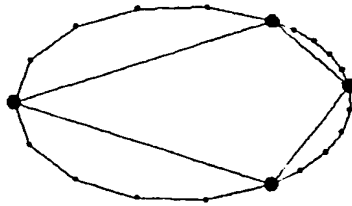


FIG.14



$$P = \{p_0, \dots, p_{n-1}\}$$

$$Q = \{q_0, \dots, q_{n-1}\}, \quad P \subset Q$$

● Polygon

P

FrenetFrame{ q_i, t_i, b_i, n_i }

$$t_i = \frac{q_{i+1} - q_{i-1}}{\|q_{i+1} - q_{i-1}\|}$$

$$b_i = \frac{(q_{i-1} - q_i) \times (q_{i+1} - q_i)}{\|(q_{i-1} - q_i) \times (q_{i+1} - q_i)\|}$$

$$n_i = b_i \times t_i$$

$$\kappa(q_{i-1}, q_i, q_{i+1}) = \frac{2\|(q_{i+1} - q_i) \times (q_{i-1} - q_i)\|}{\|q_{i+1} - q_i\| \|q_{i-1} - q_i\| \|q_{i+1} - q_{i-1}\|}$$

$$k_i = \kappa_i b_i = \frac{2}{\gamma_i} (q_{i+1} - q_i) \times (q_{i-1} - q_i)$$

q : COORDINATE

t : UNIT TANGENTIAL VECTOR

b : UNIT NORMAL VECTOR

n : UNIT ACCESSORY NORMAL VECTOR

k : DISCRET CURVATURE NORMAL VECTOR

FIG.15

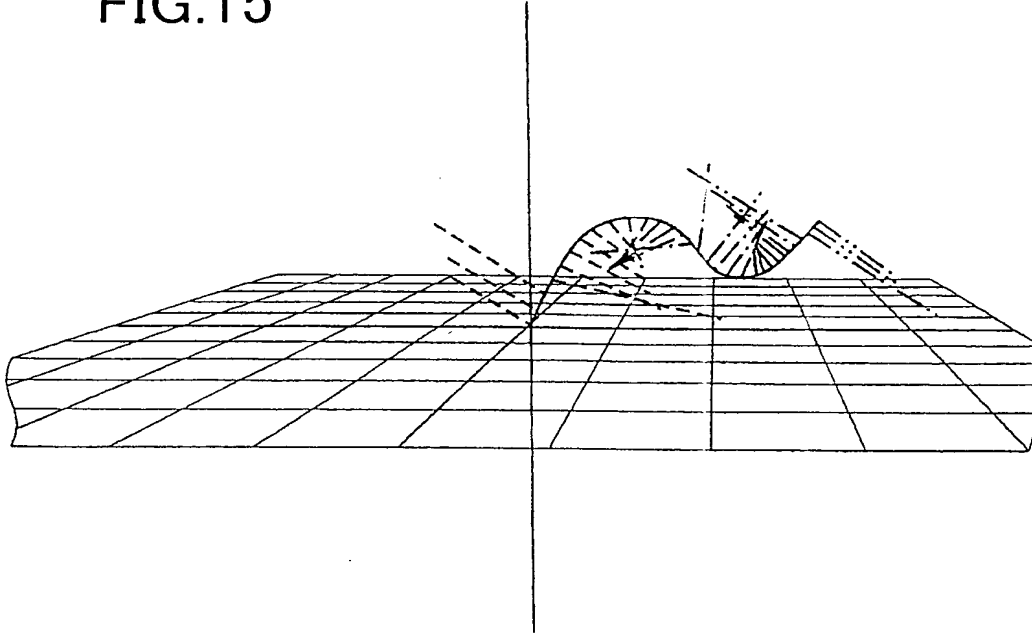


FIG.16

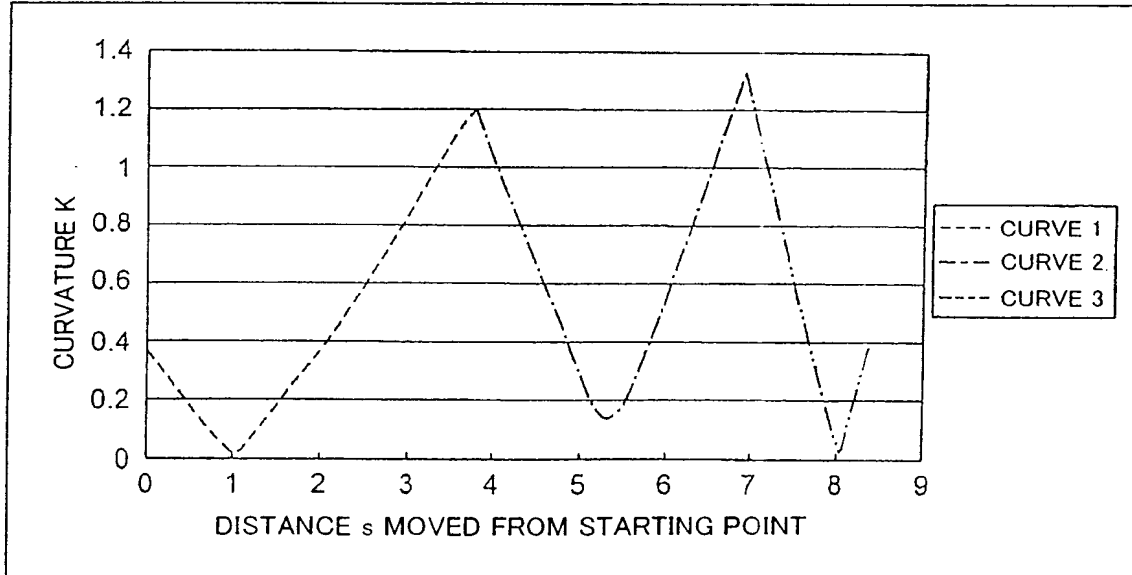


FIG.17

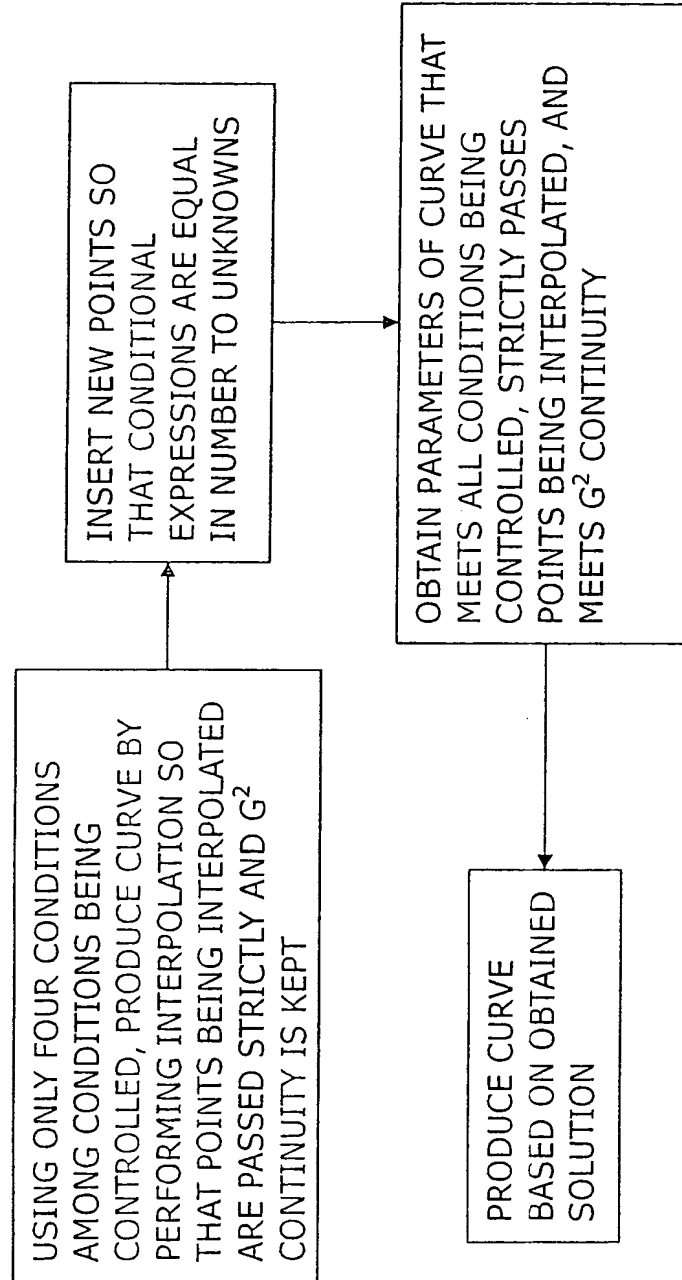


FIG.18

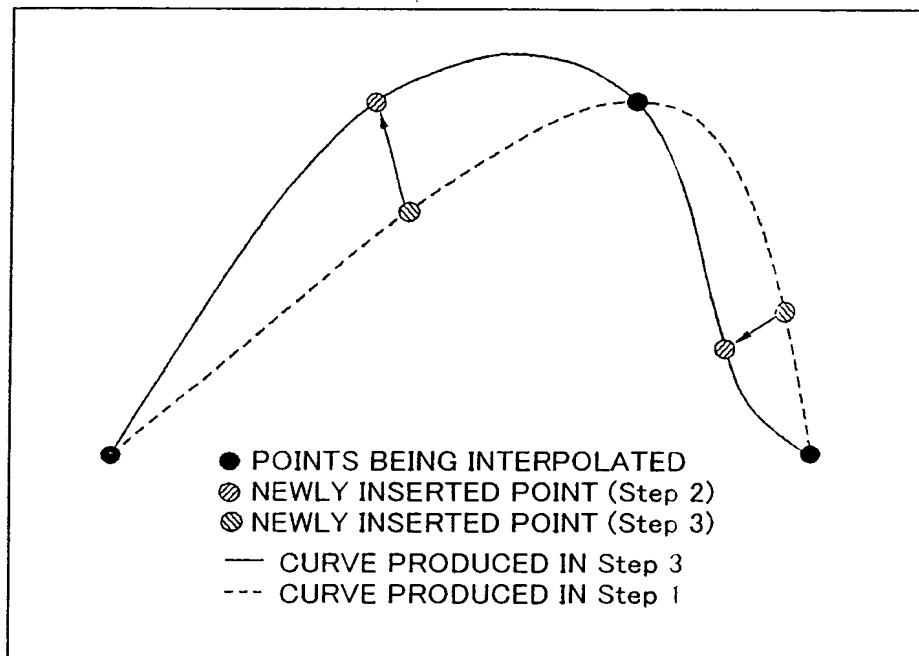


FIG.19

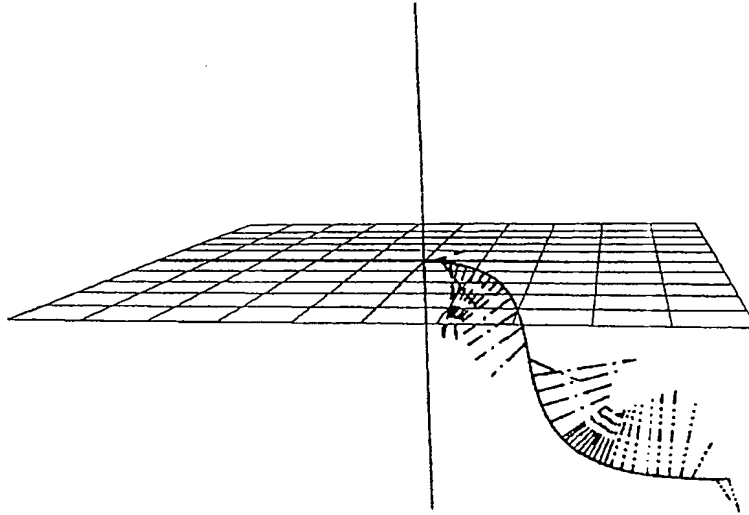


FIG.20

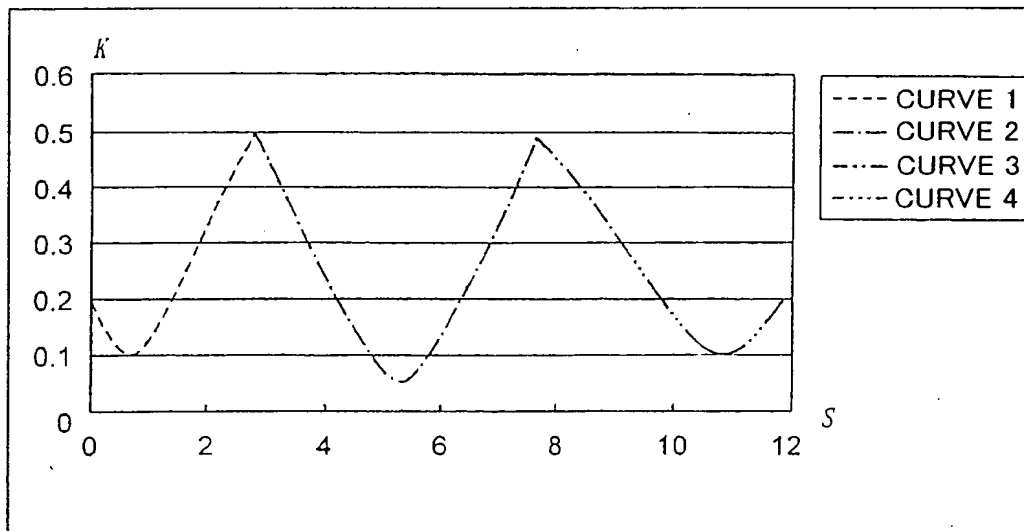


FIG.21

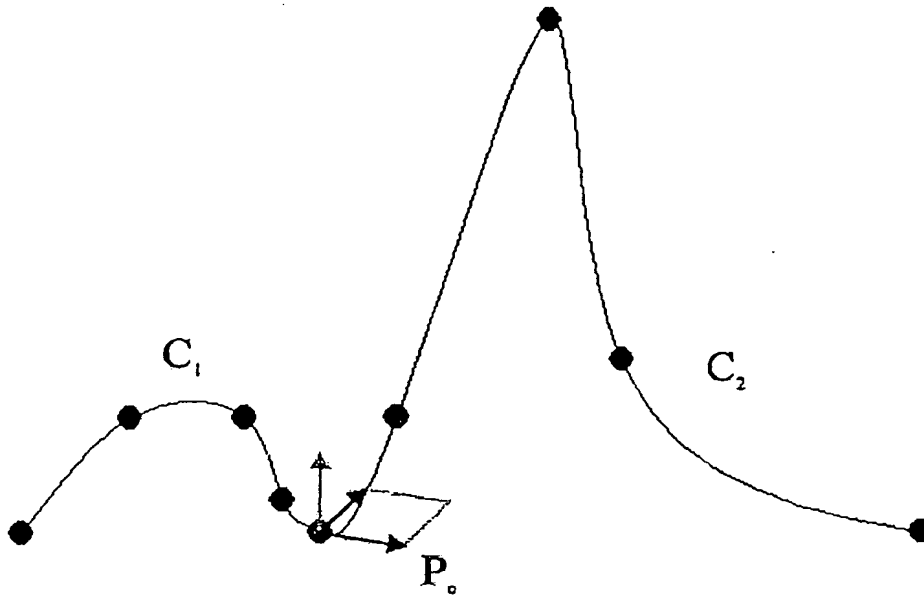


FIG.22

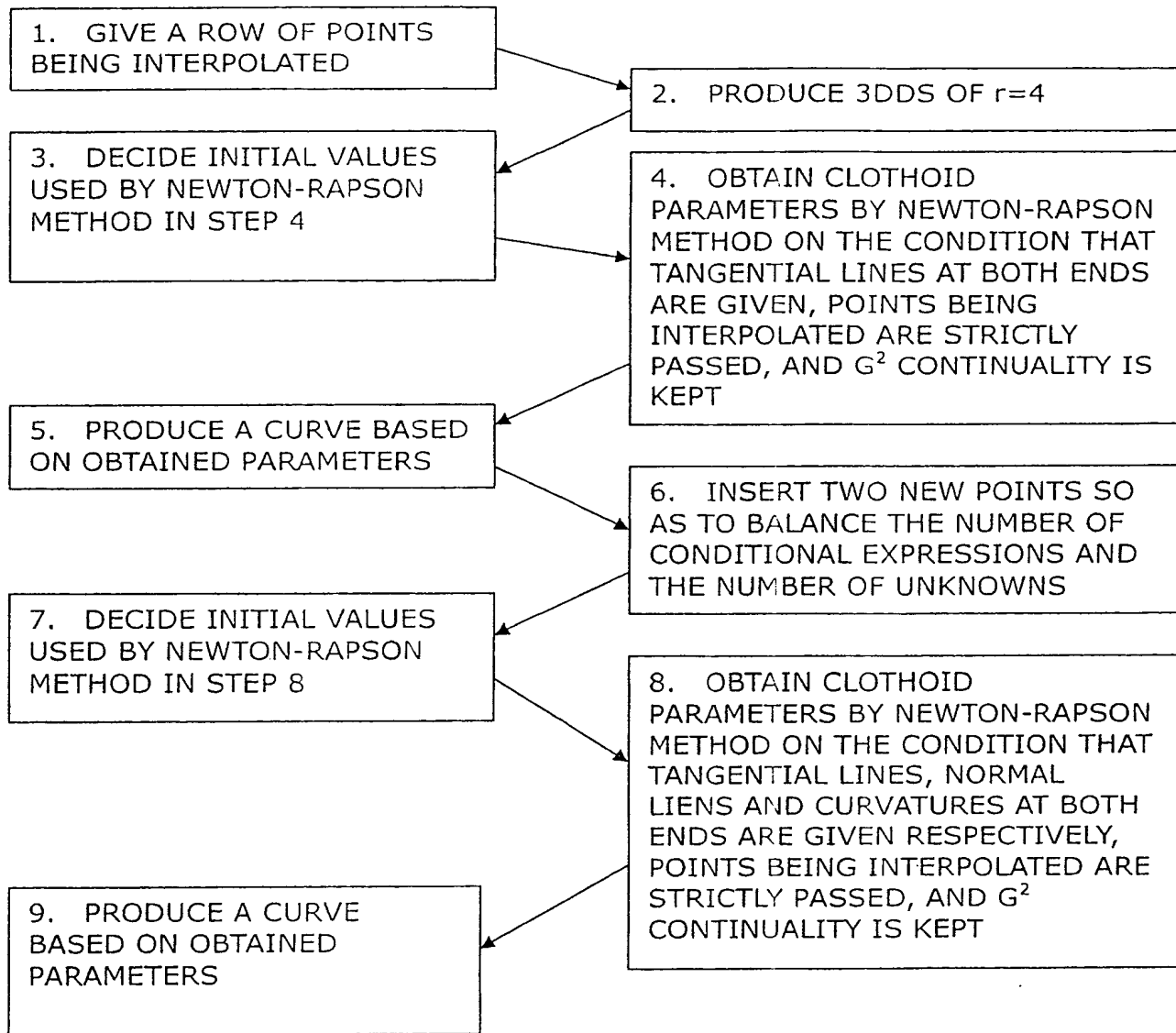


FIG.23

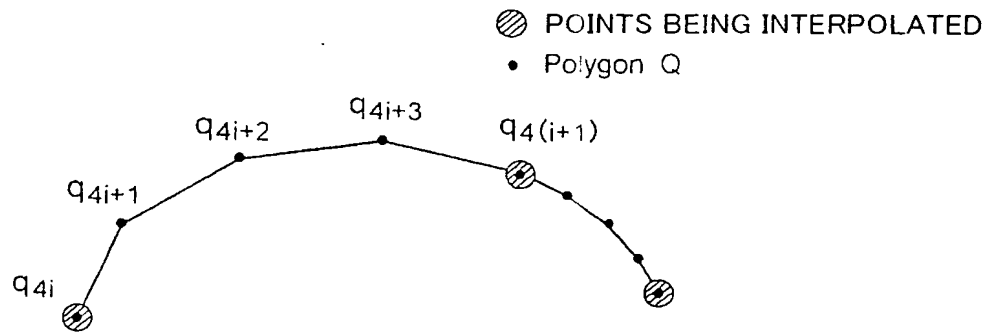


FIG.24

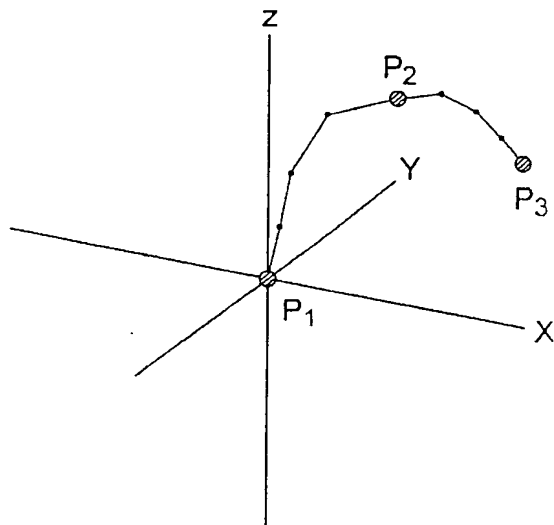


FIG.25

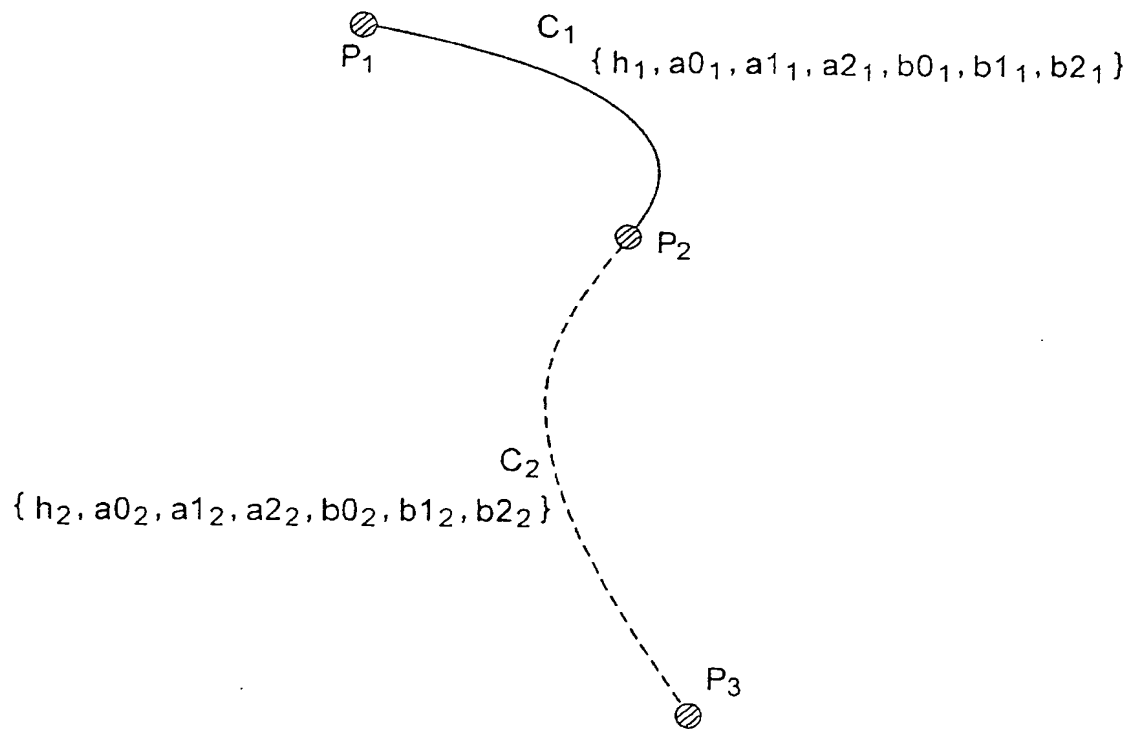


FIG.26

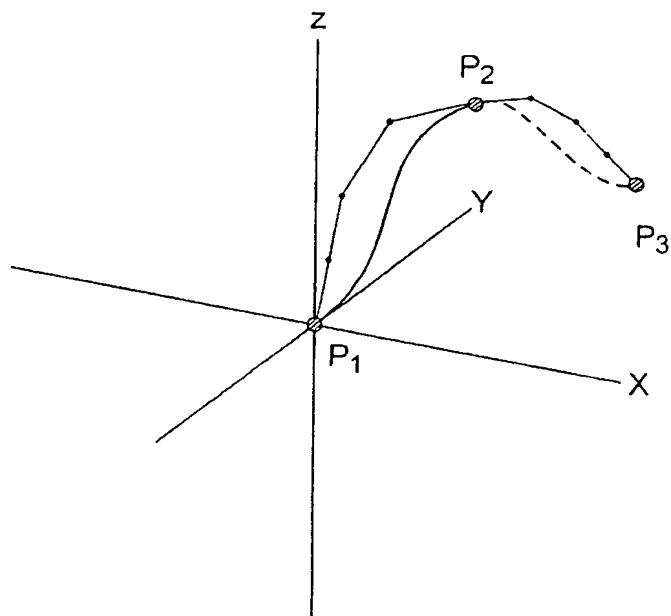


FIG.27

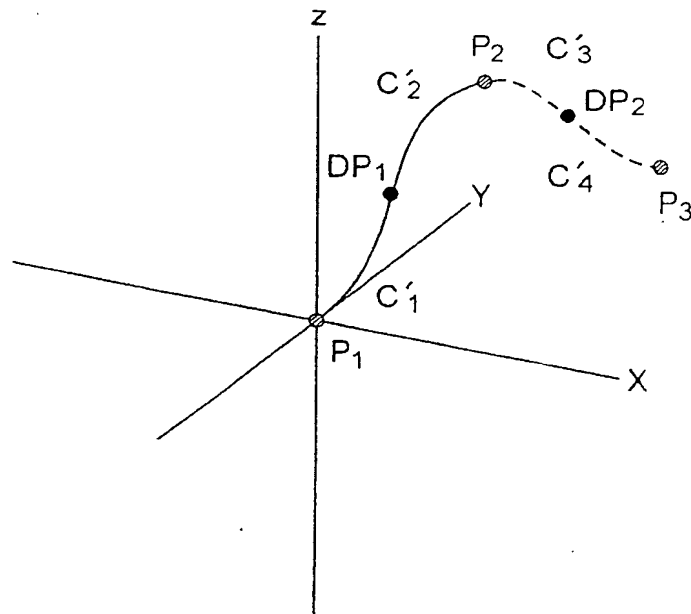


FIG.28

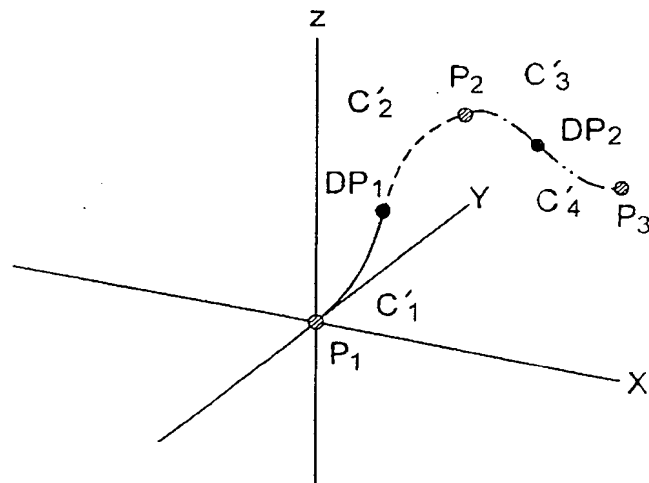


FIG.29

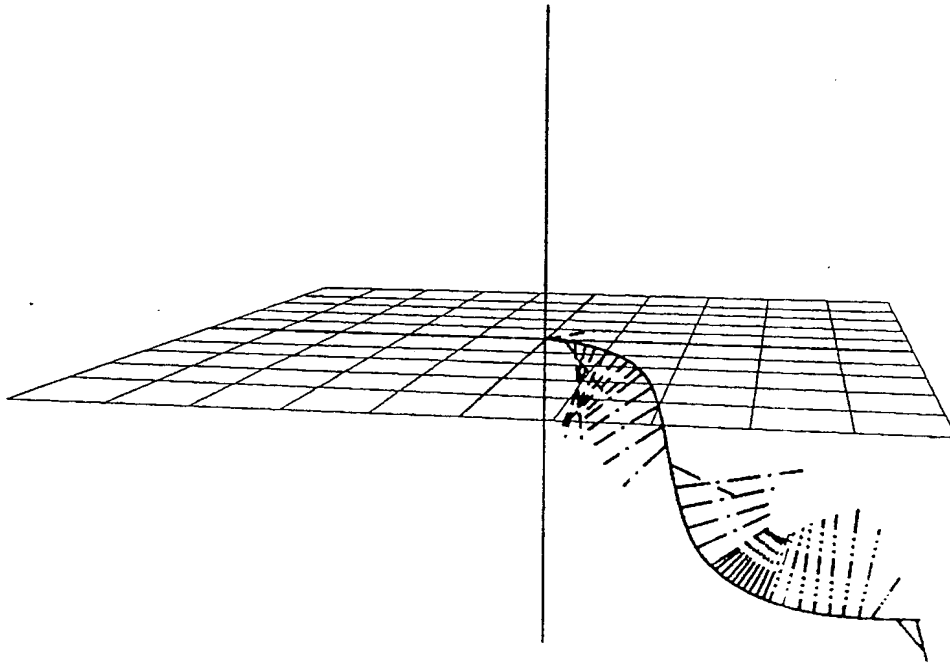


FIG.30

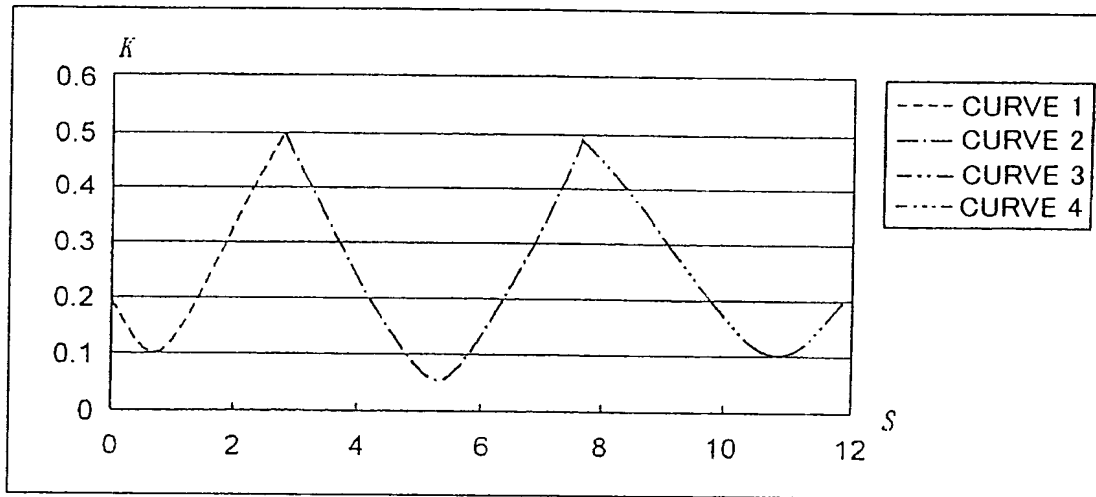


FIG.31

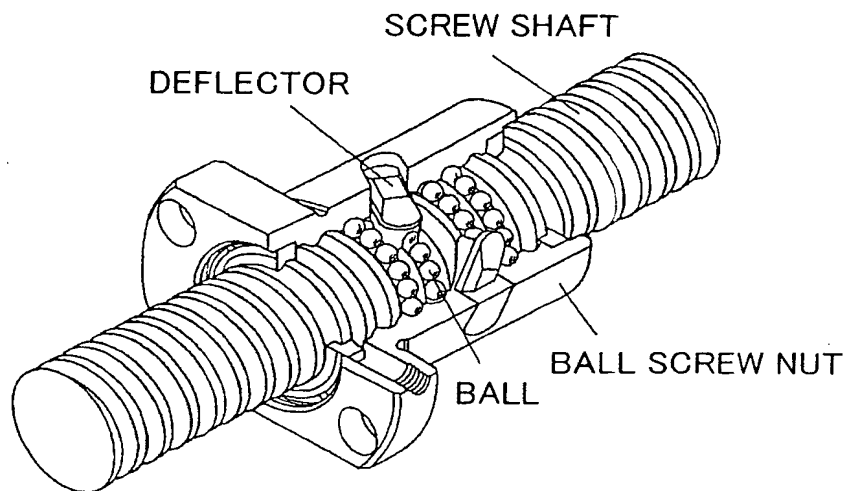


FIG.32

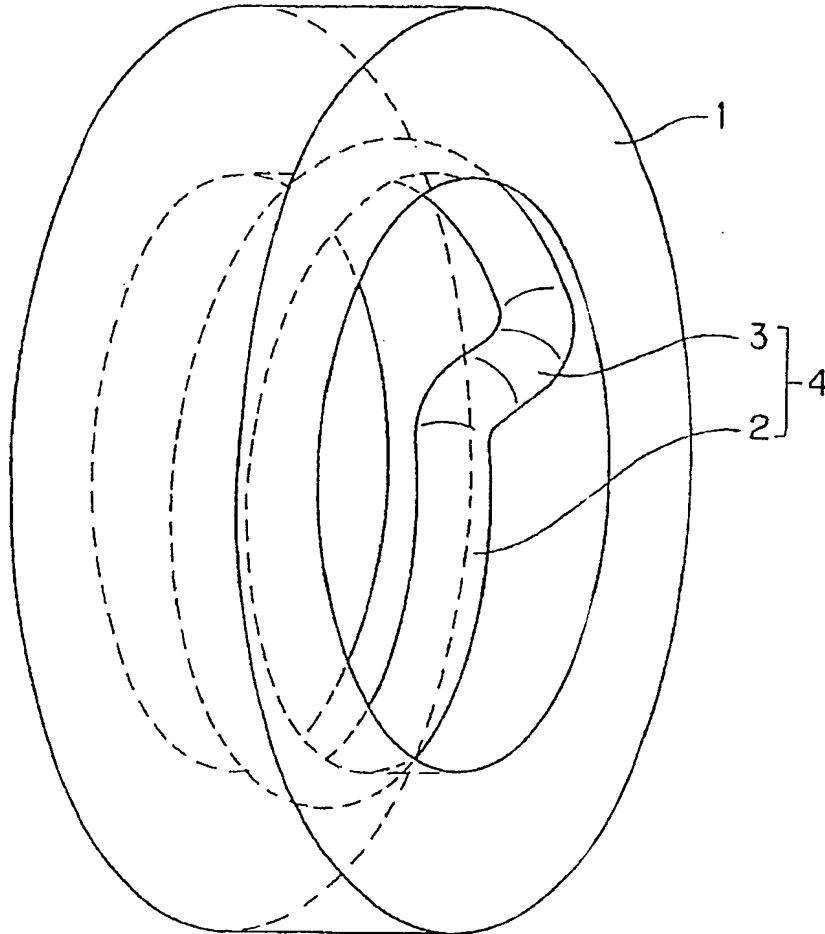


FIG.33A

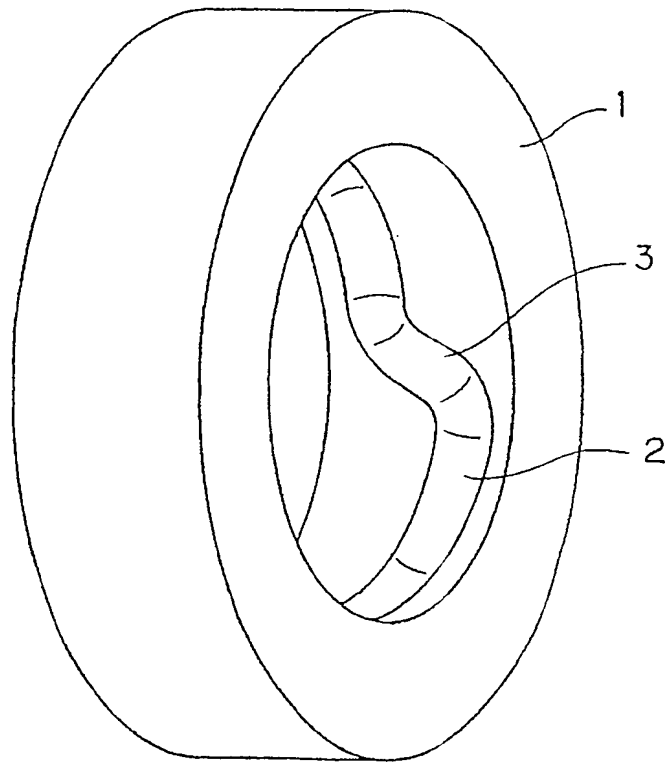


FIG.33B

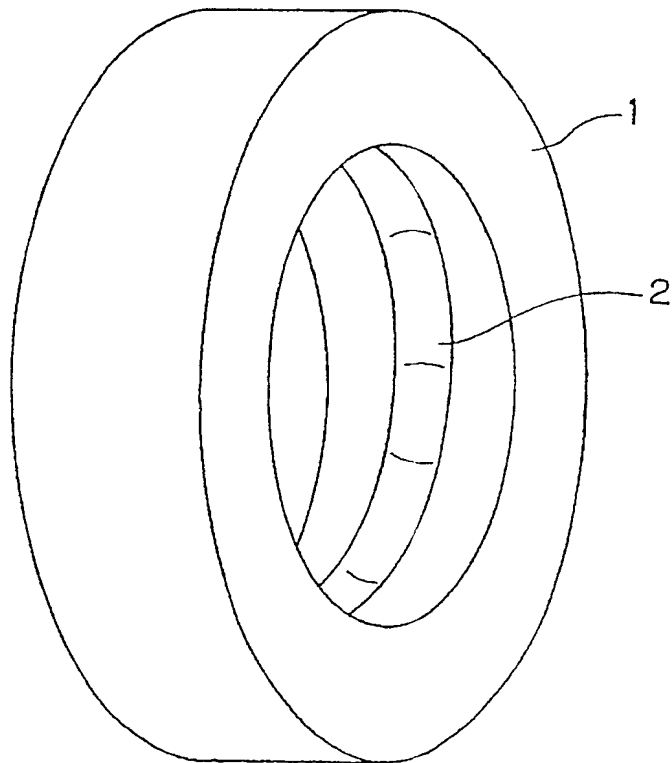


FIG.34

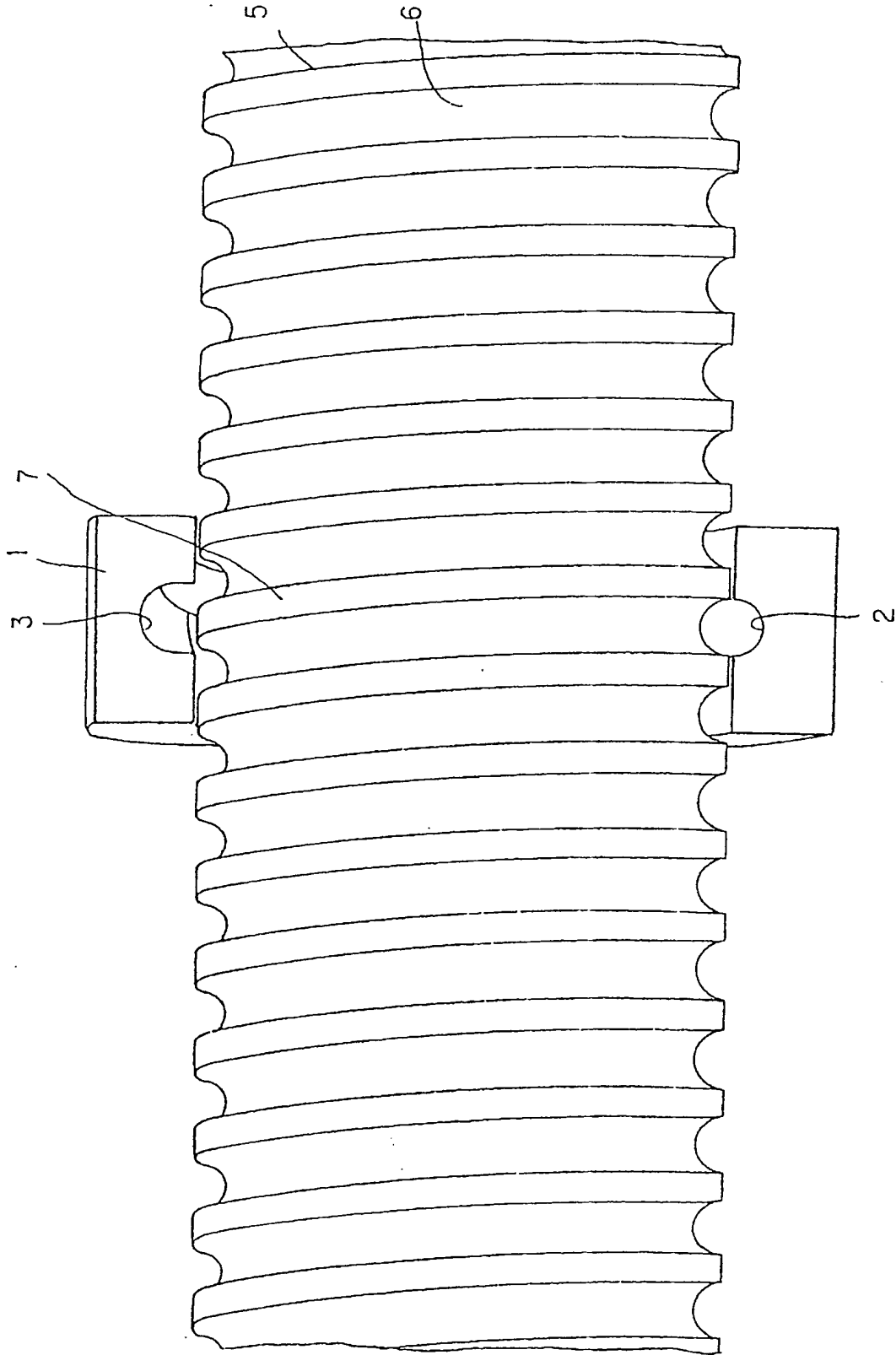


FIG.35

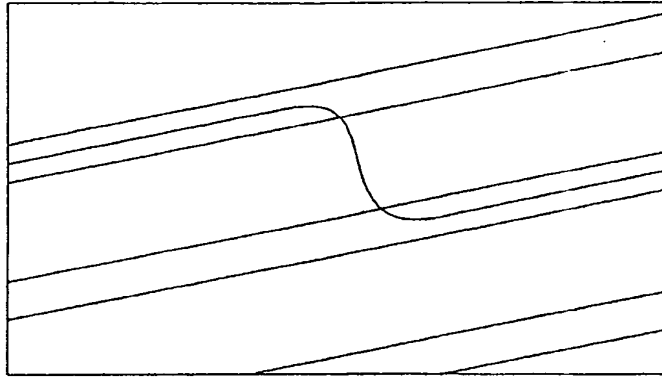


FIG.36

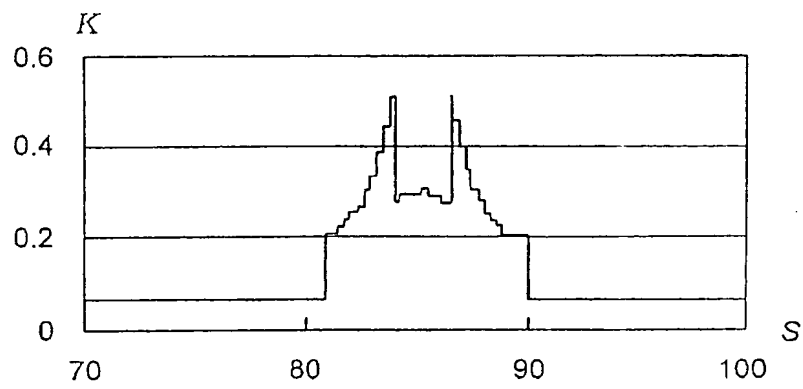


FIG.37

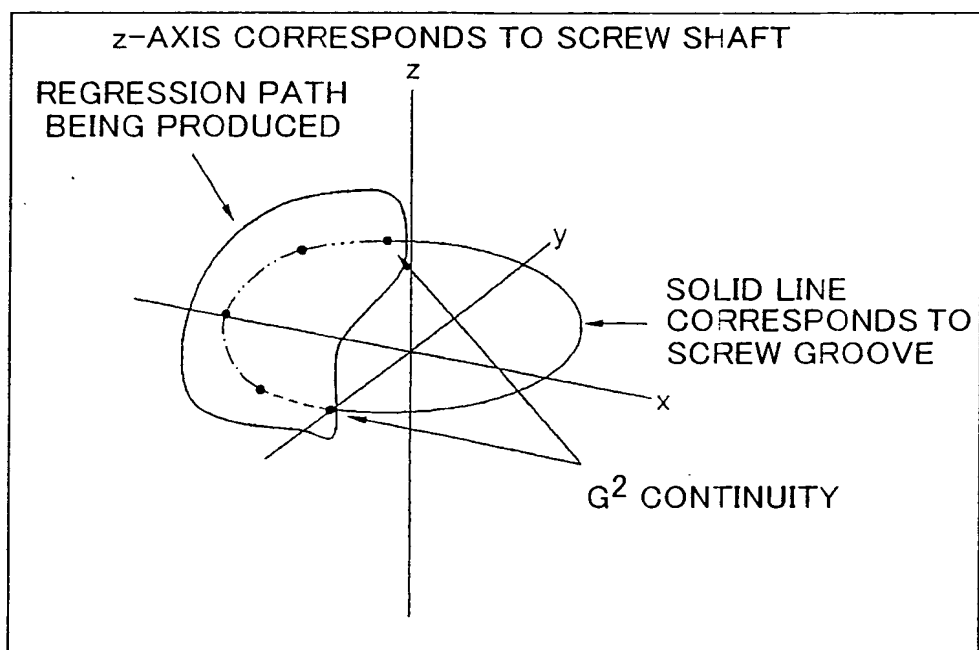


FIG.38

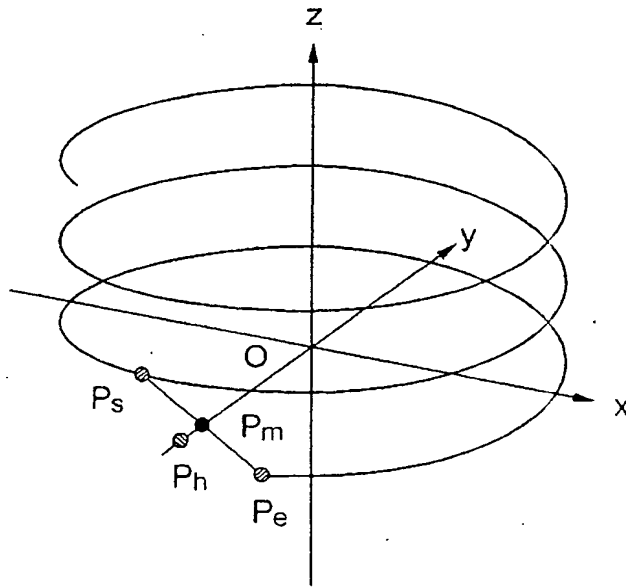


FIG.39

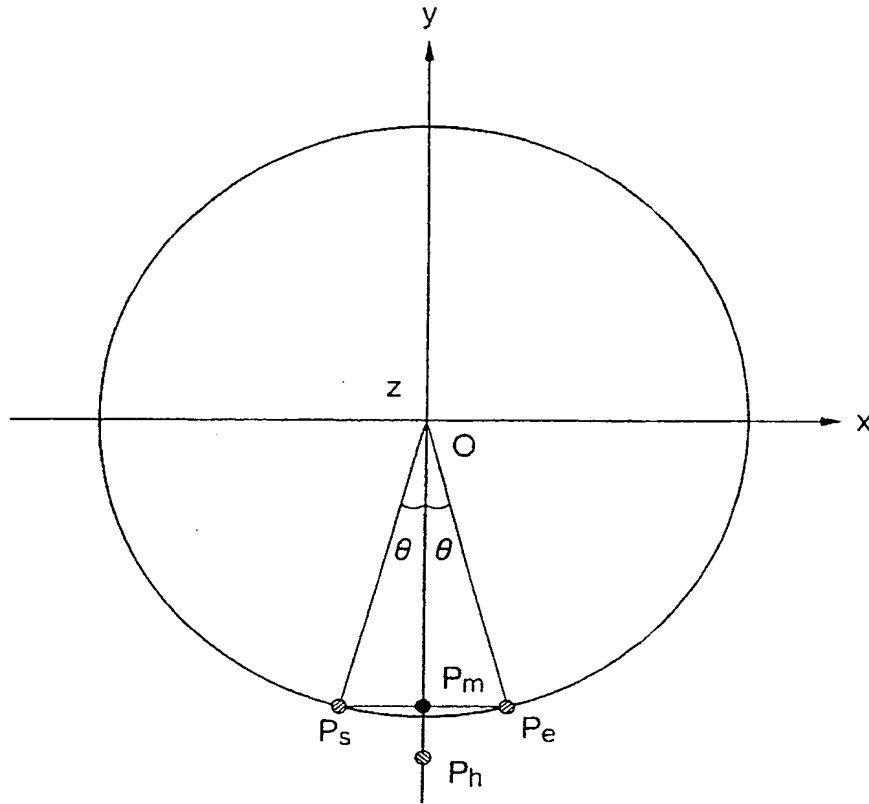


FIG.40

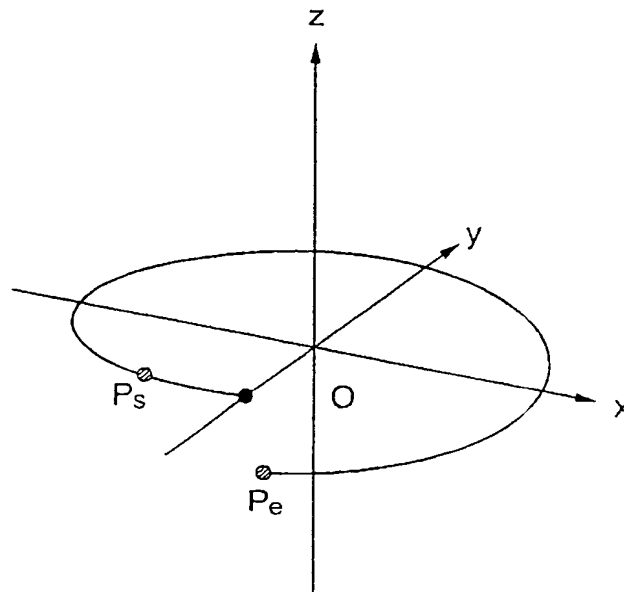


FIG.41

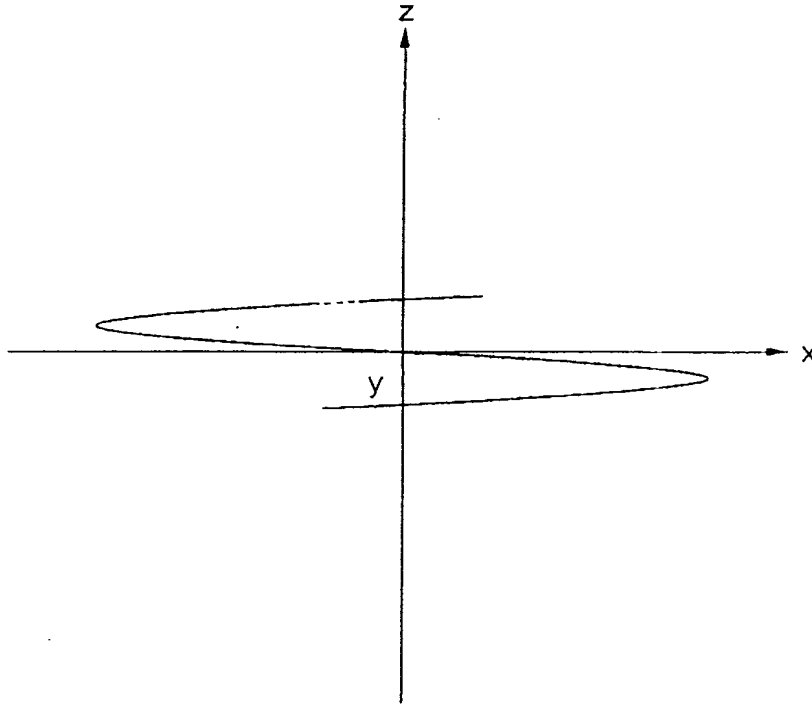
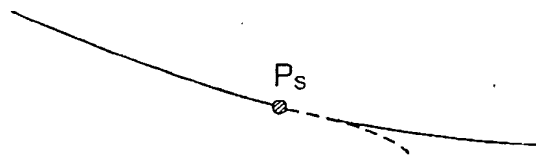


FIG.42



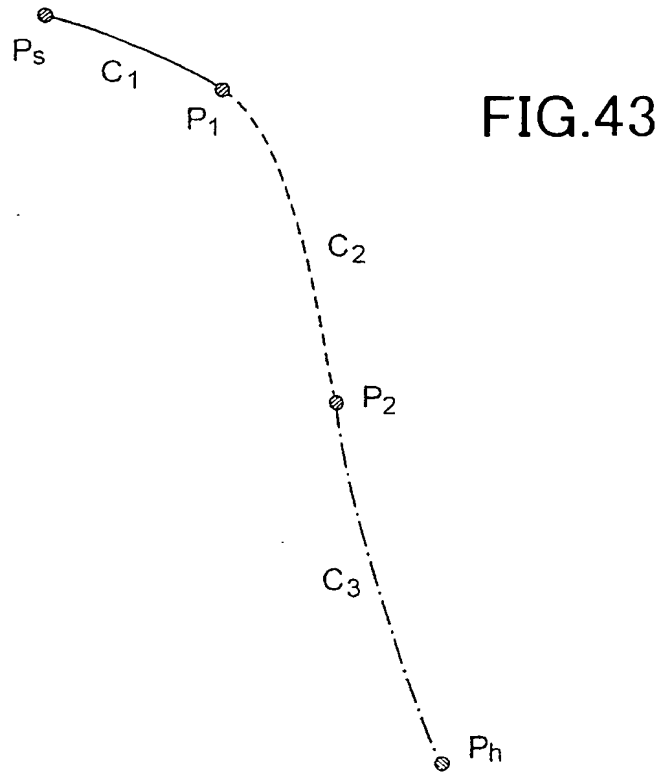


FIG.44

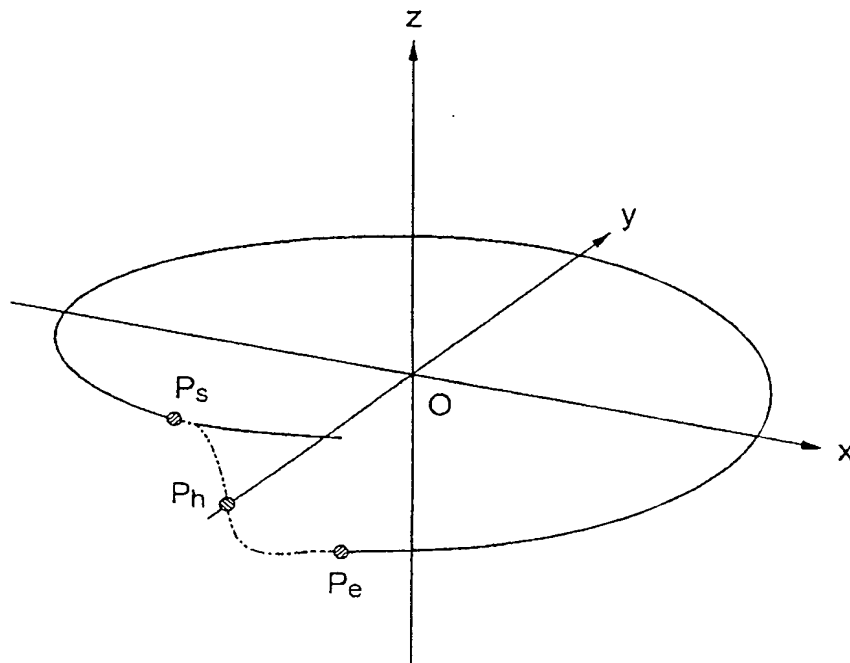


FIG.45

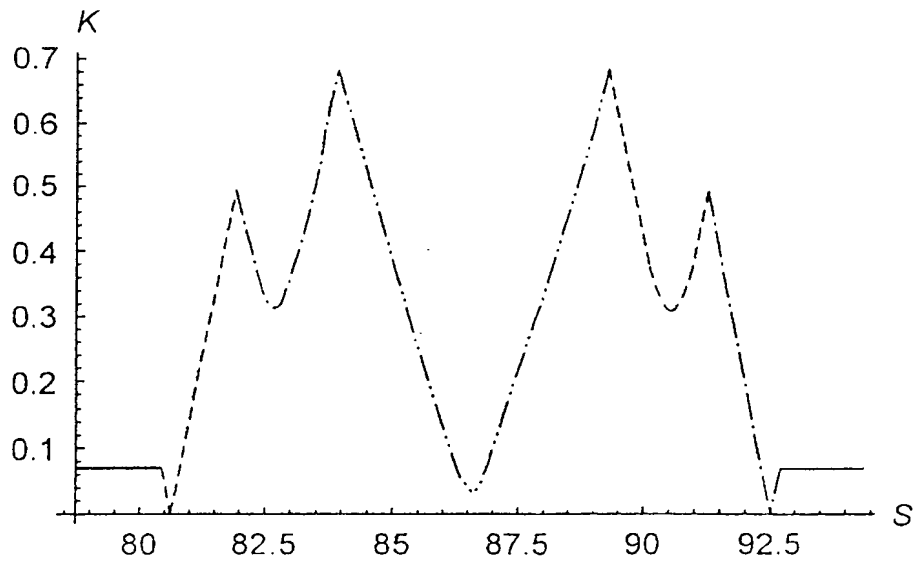


FIG.46

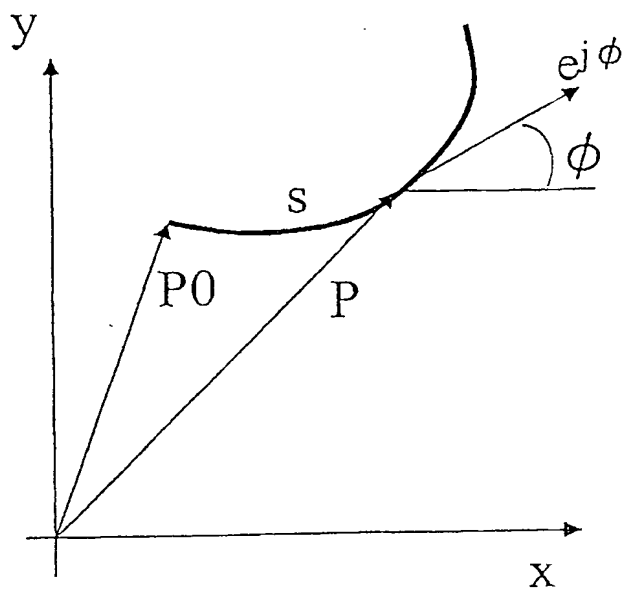


FIG.47

CLOTHOID

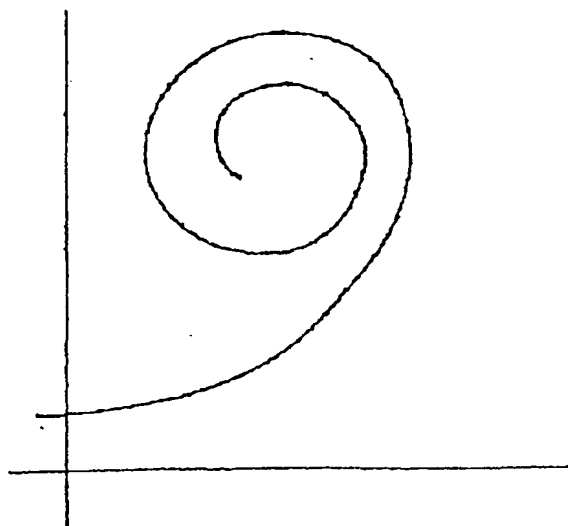


FIG.48

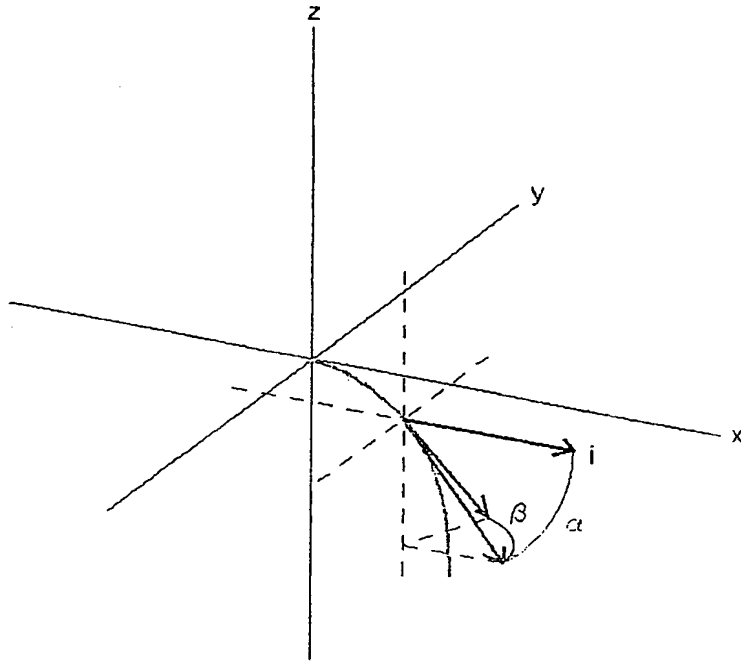


FIG.49

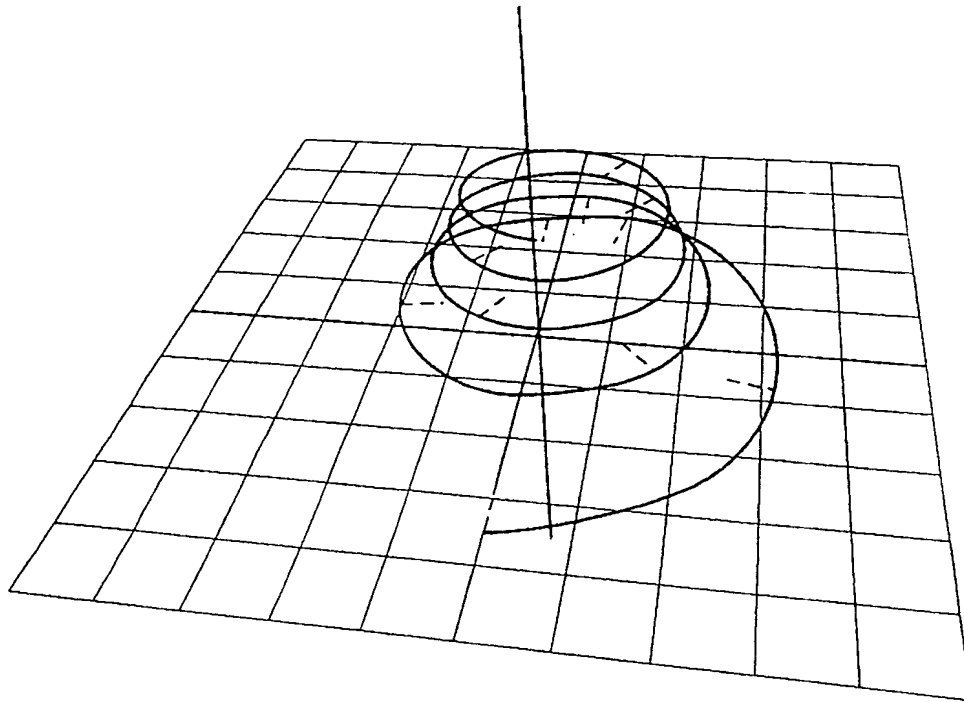


FIG.50

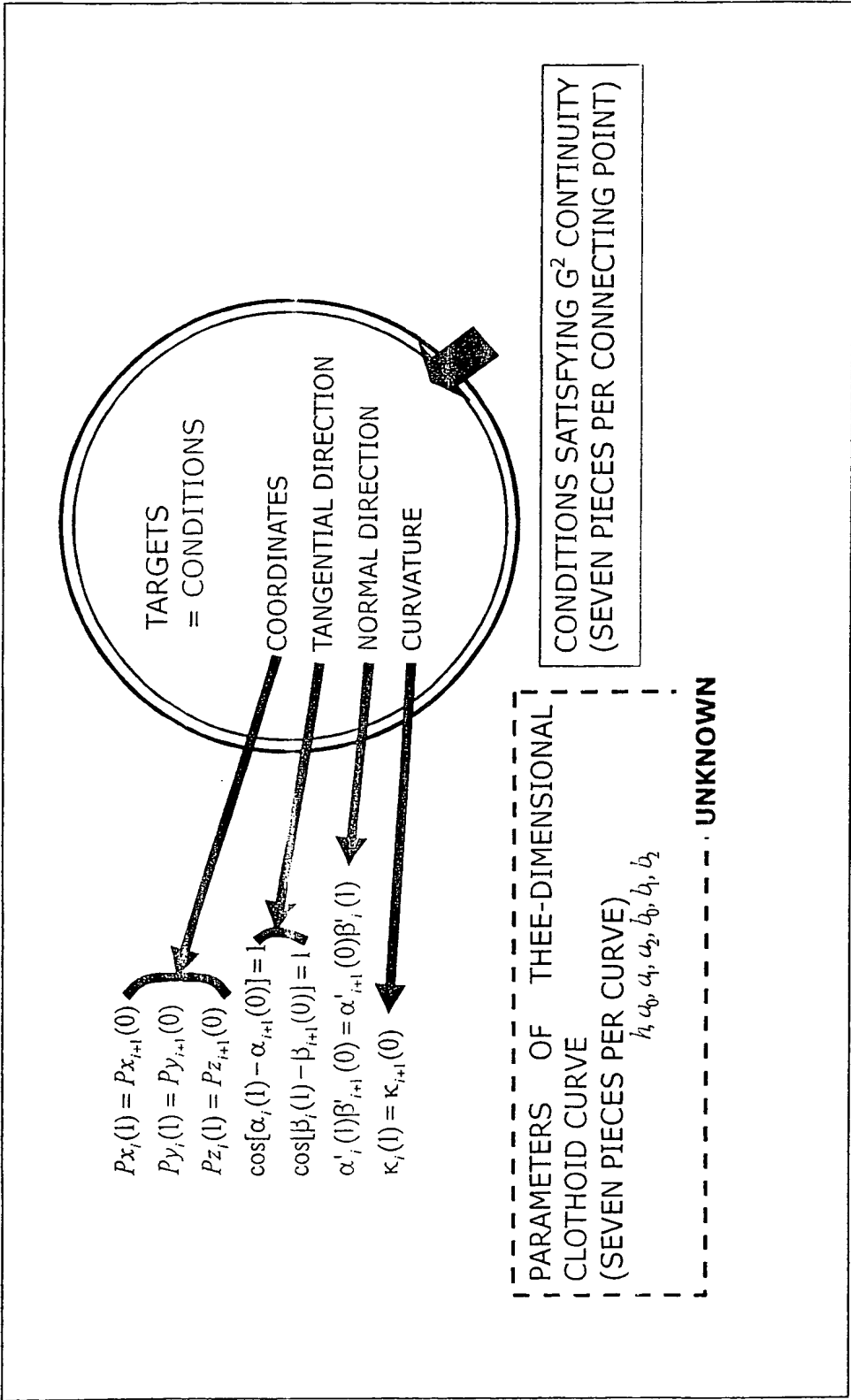


FIG.51

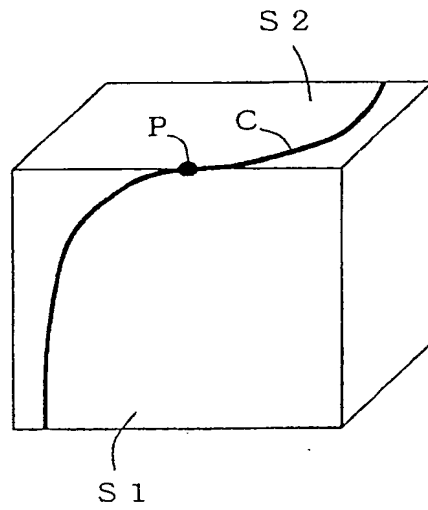


FIG. 52

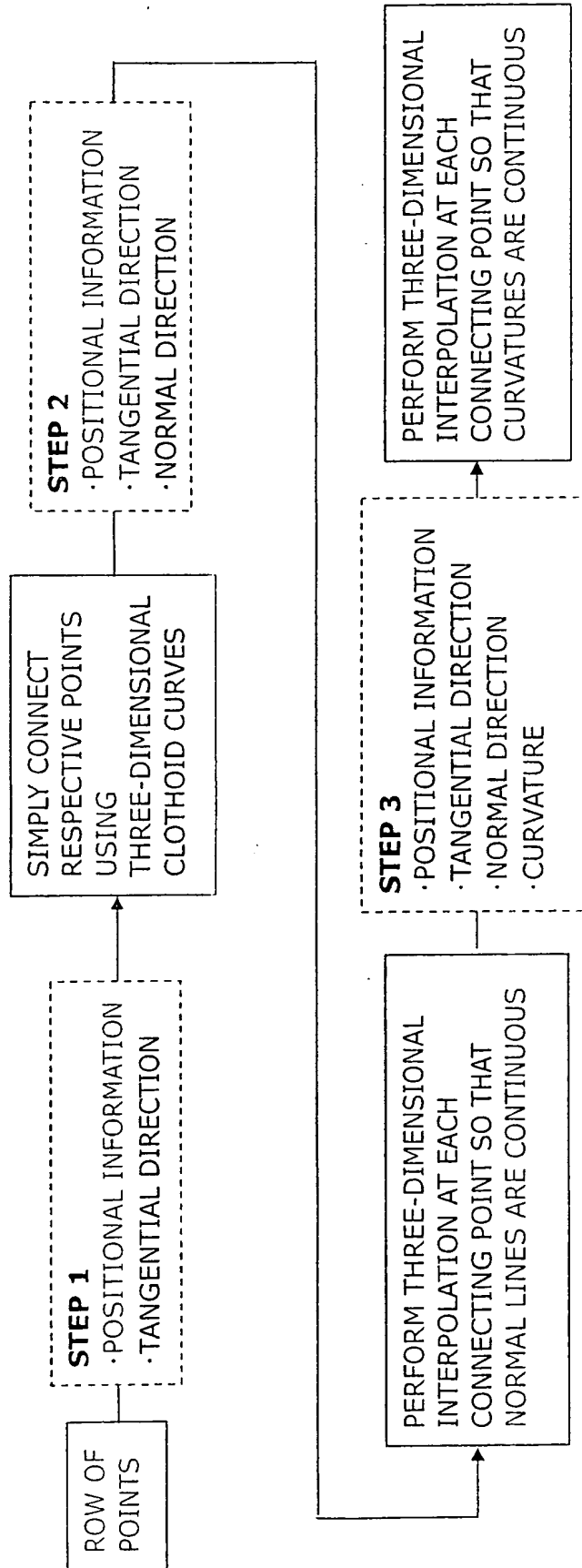


FIG.53

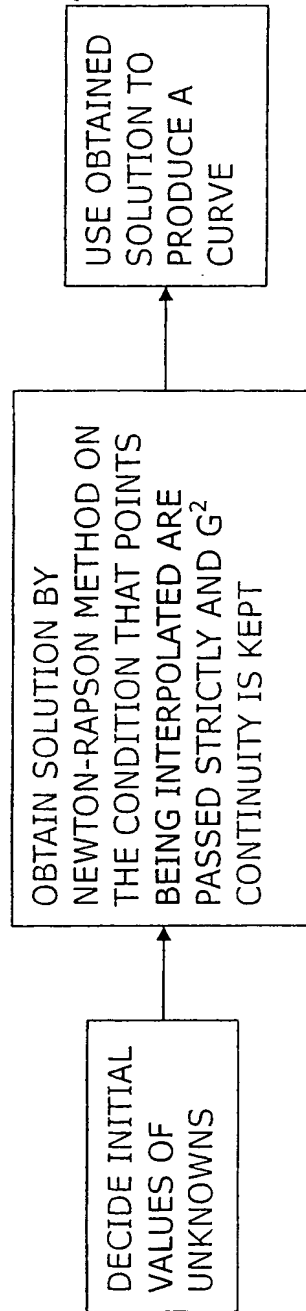


FIG.54

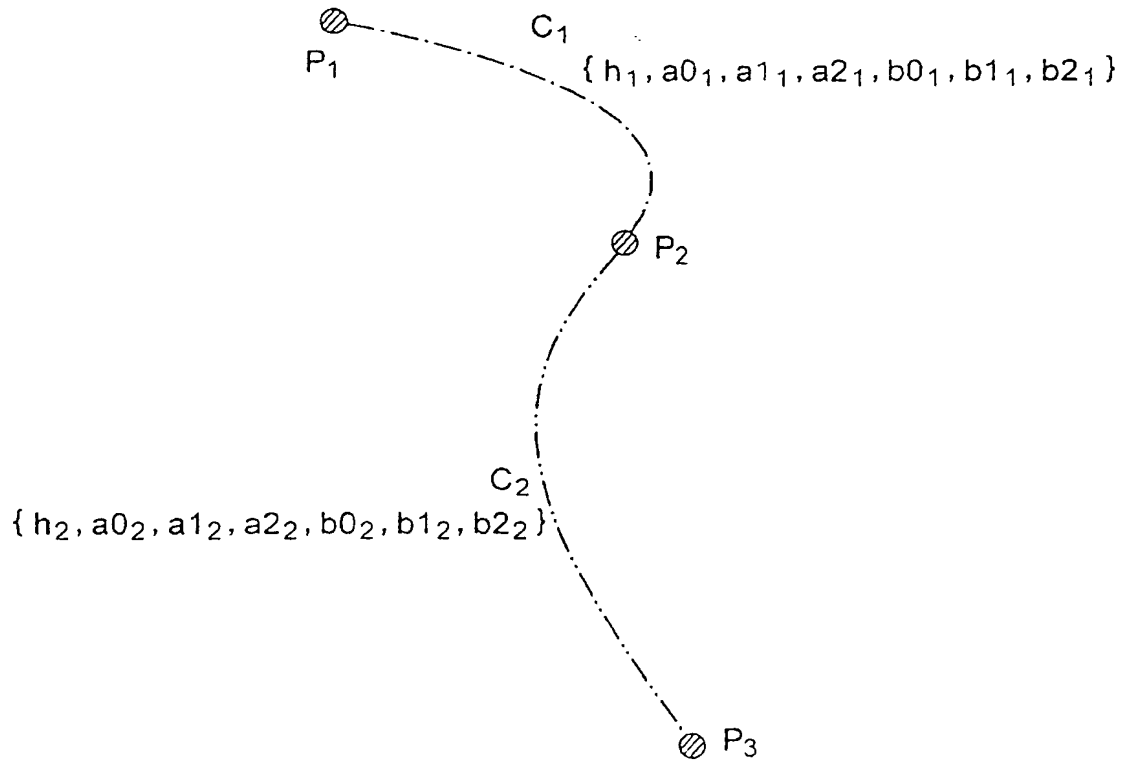


FIG.55

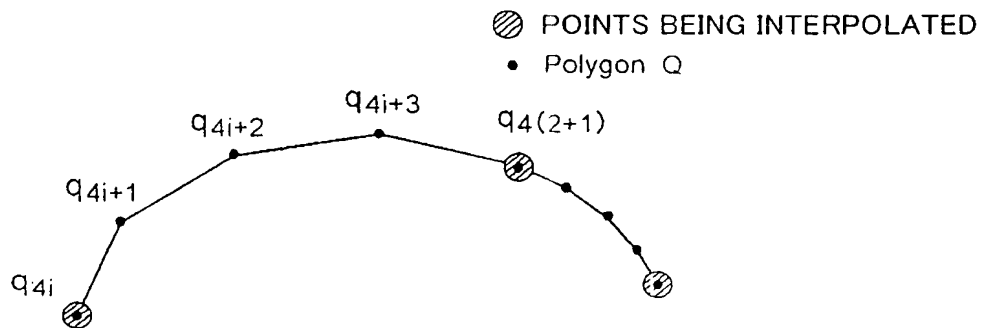
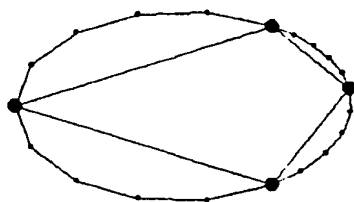


FIG.56



$$P = \{p_0, \dots, p_{n-1}\}$$

$$Q = \{q_0, \dots, q_{n-1}\}, \quad P \subset Q$$

● Polygon

P

FrenetFrame{ q_i, t_i, b_i, n_i }

$$t_i = \frac{q_{i+1} - q_{i-1}}{\|q_{i+1} - q_{i-1}\|}$$

$$b_i = \frac{(q_{i-1} - q_i) \times (q_{i+1} - q_i)}{\|(q_{i-1} - q_i) \times (q_{i+1} - q_i)\|}$$

$$n_i = b_i \times t_i$$

$$\kappa(q_{i-1}, q_i, q_{i+1}) = \frac{2\|(q_{i+1} - q_i) \times (q_{i-1} - q_i)\|}{|q_{i+1}q_i||q_{i-1}q_i||q_{i+1}q_{i-1}|}$$

$$k_i = \kappa_i b_i = \frac{2}{\gamma_i} (q_{i+1} - q_i) \times (q_{i-1} - q_i)$$

q: COORDINATE

t : UNIT TANGENTIAL VECTOR

b: UNIT NORMAL VECTOR

n: UNIT ACCESSORY NORMAL VECTOR

k: DISCRET CURVATURE NORMAL VECTOR

FIG.57

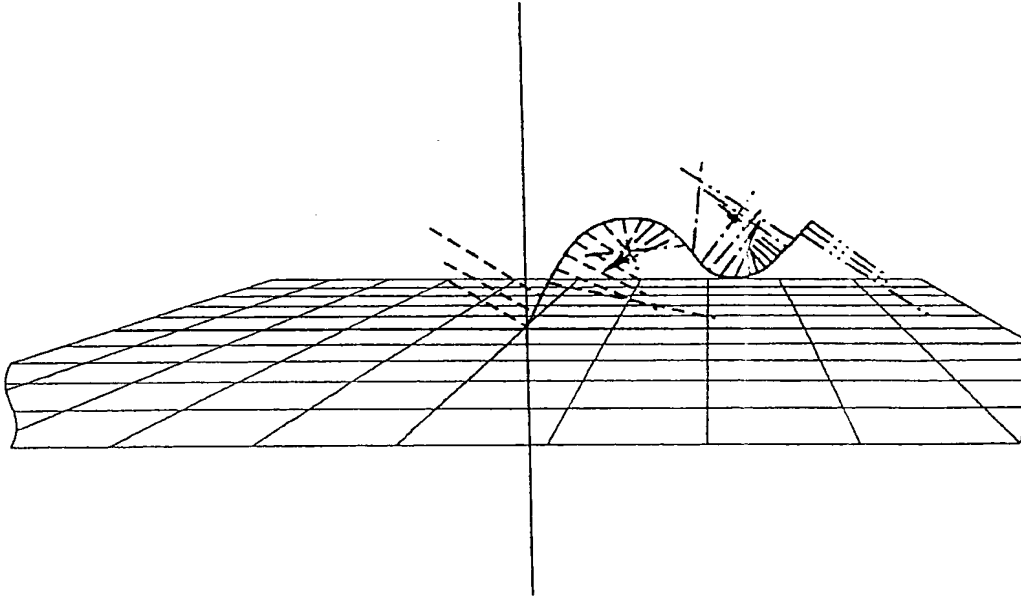


FIG.58

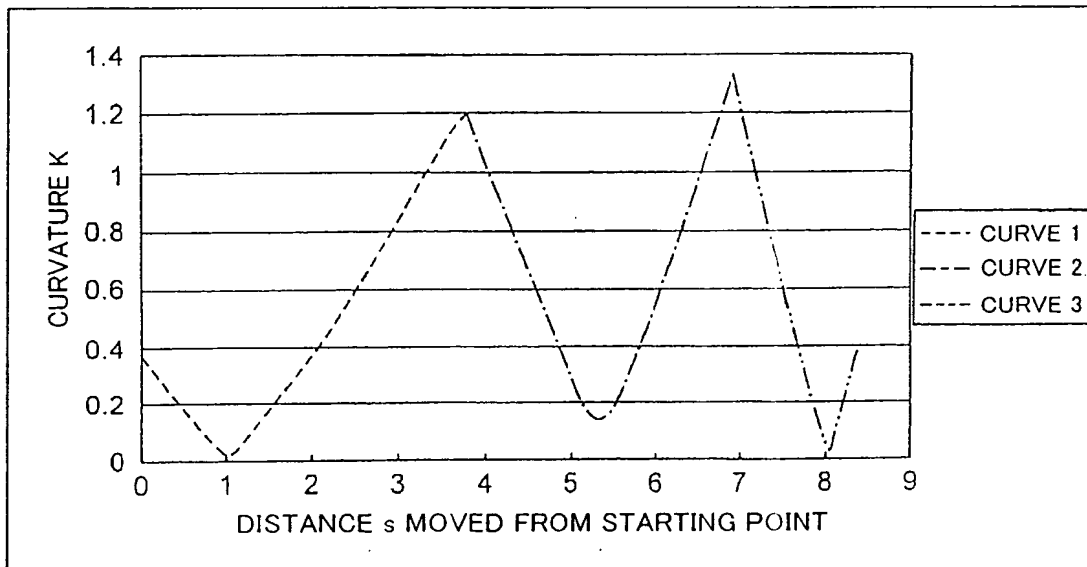


FIG.59

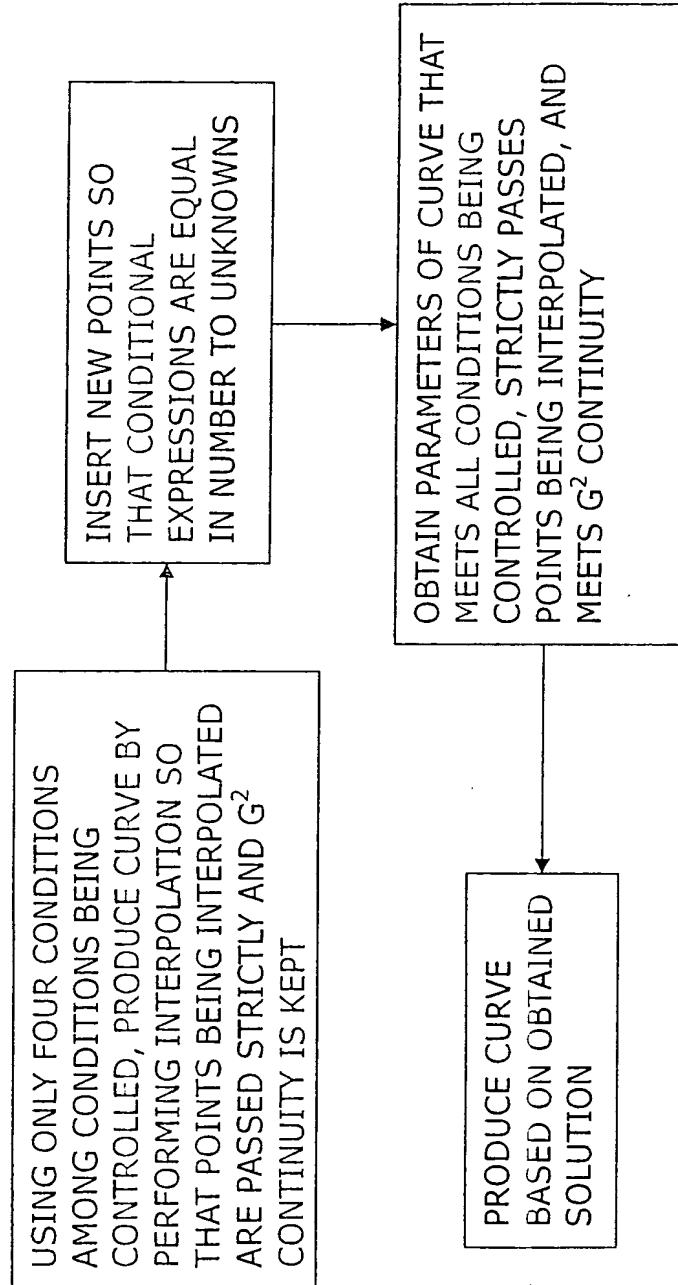


FIG.60

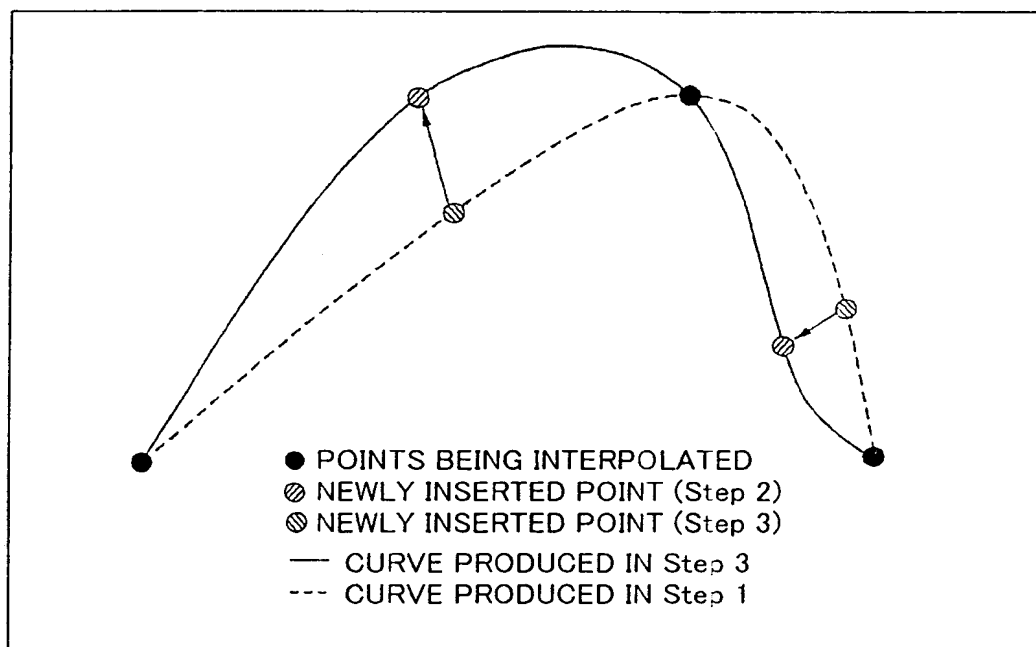


FIG.61

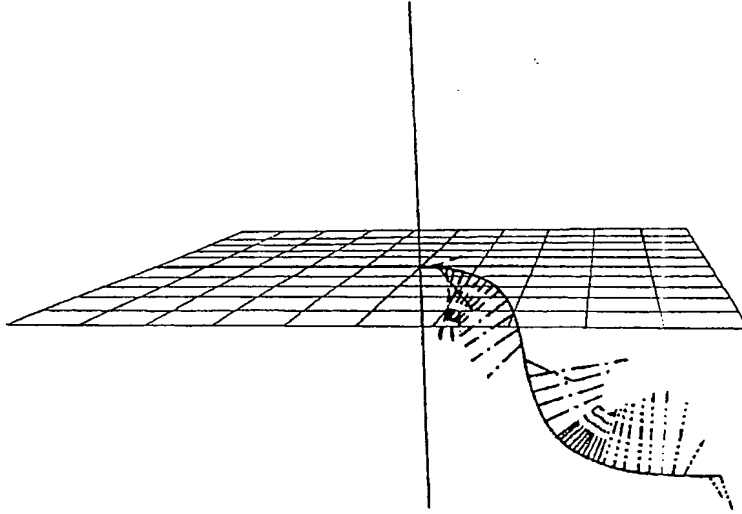


FIG.62

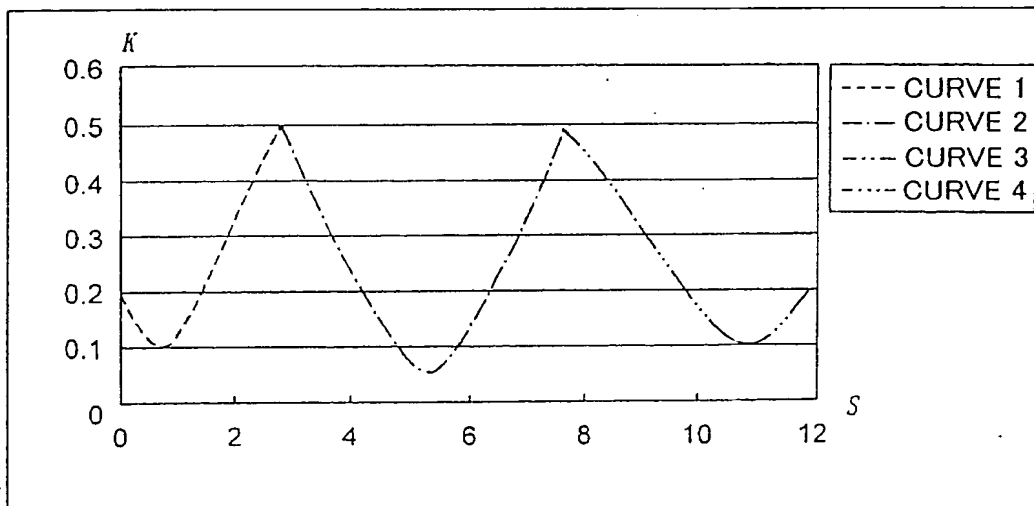


FIG.63

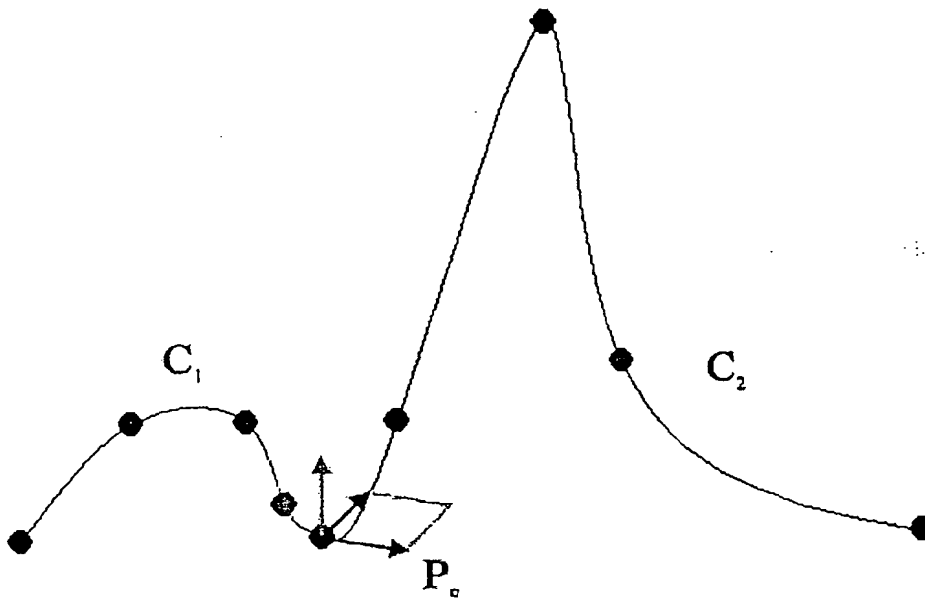


FIG.64

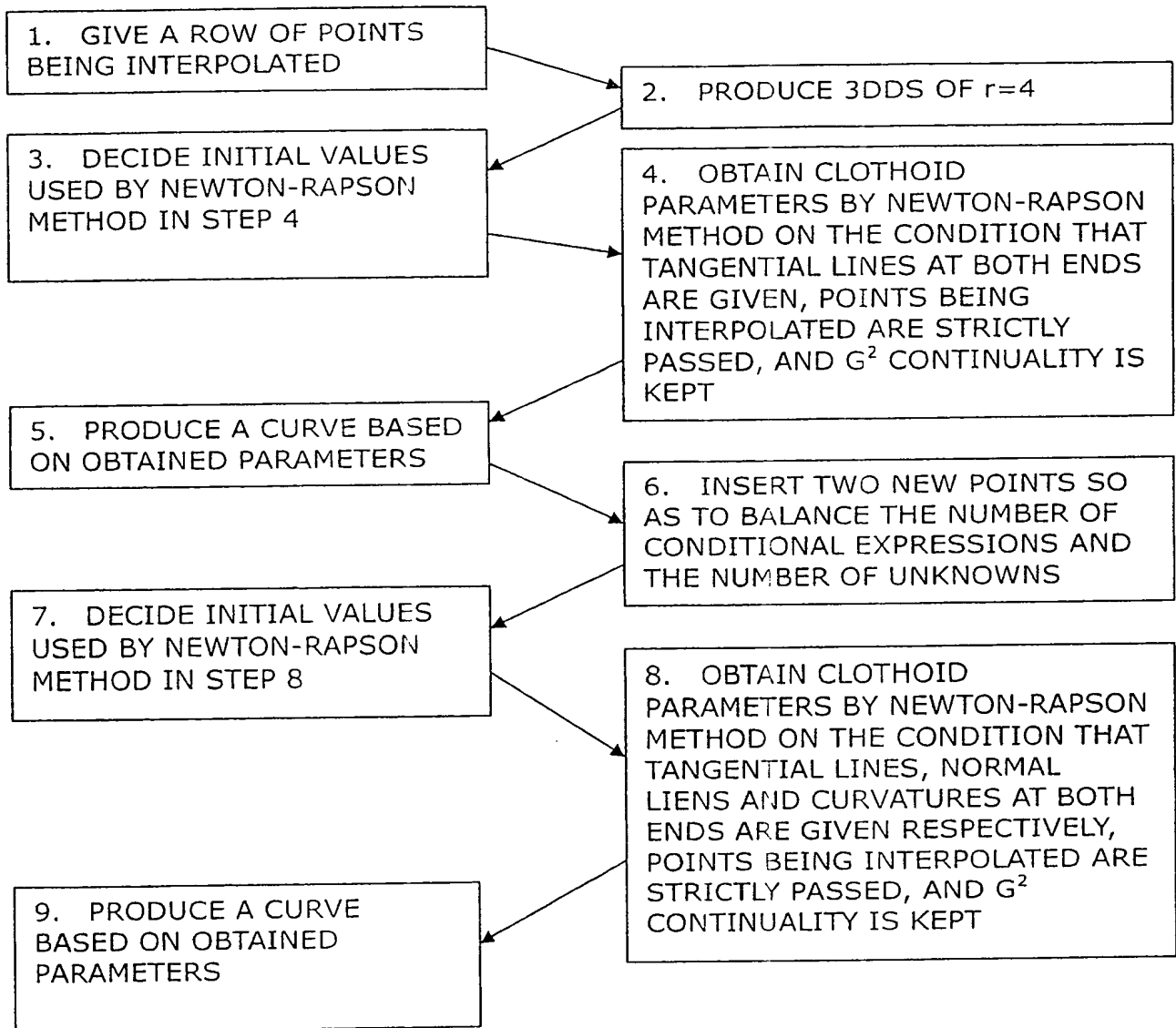


FIG.65

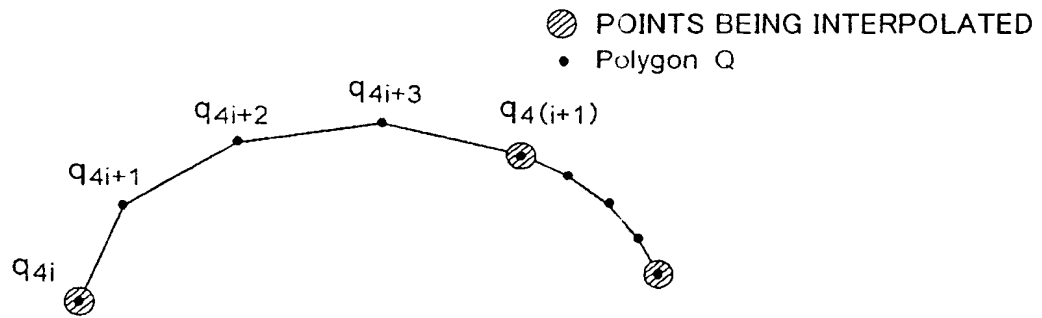


FIG.66

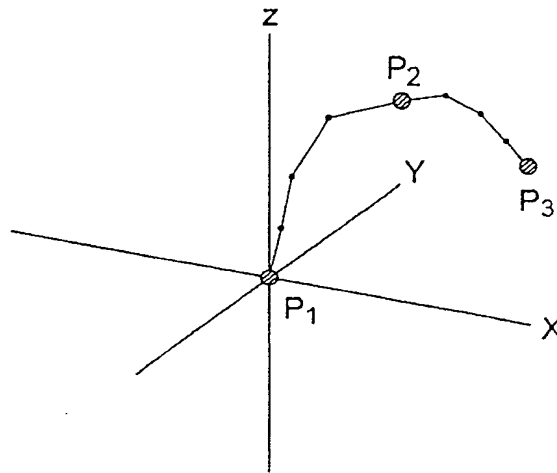


FIG.67

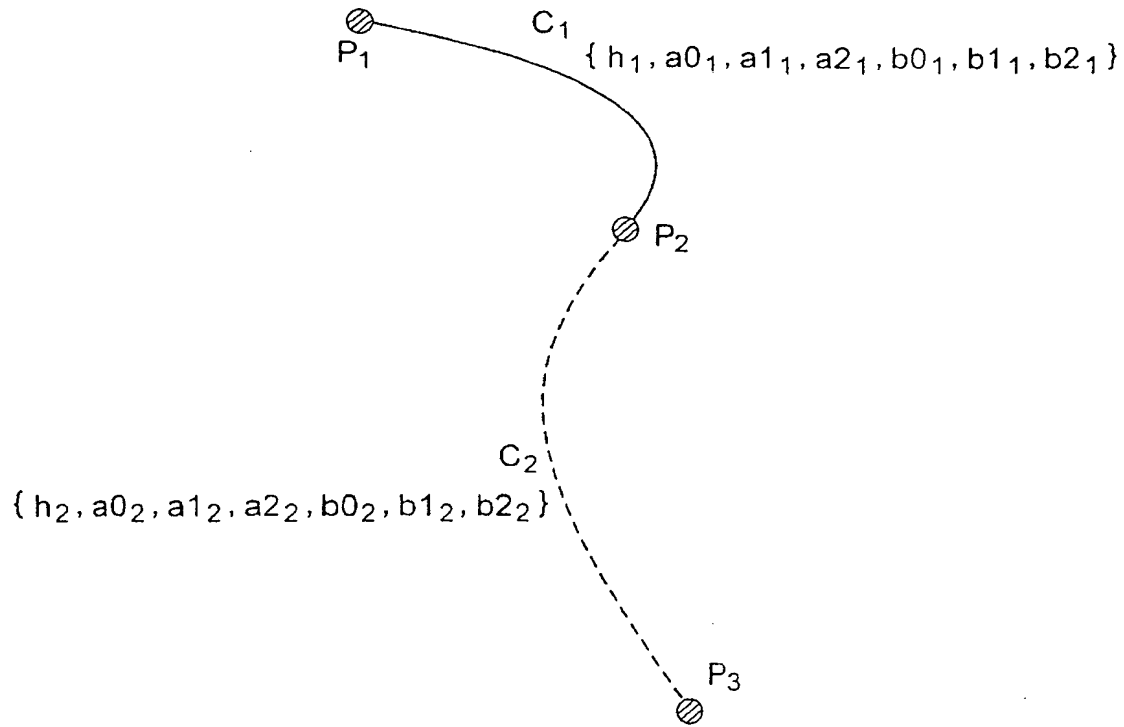


FIG.68

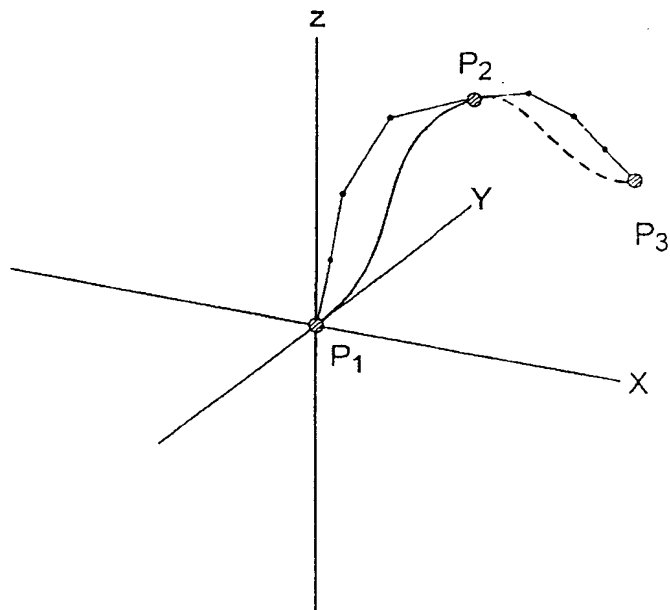


FIG.69

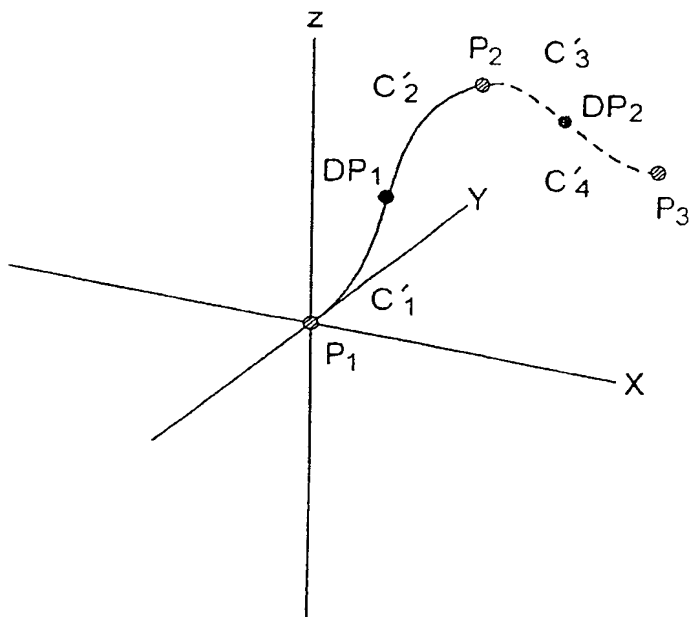


FIG.70

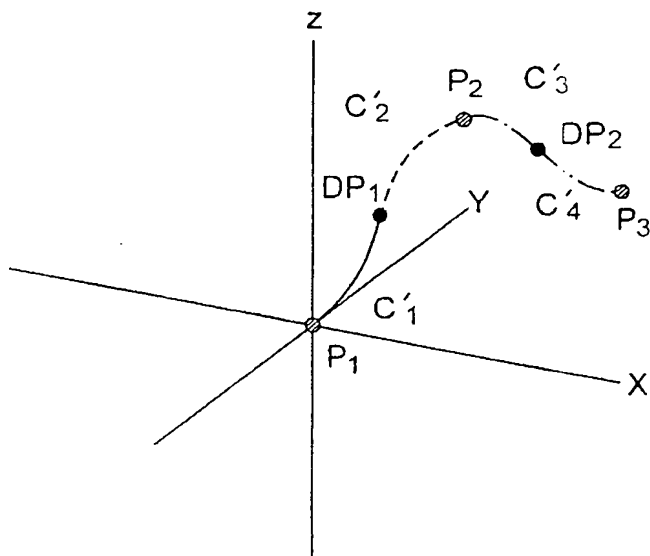


FIG.71

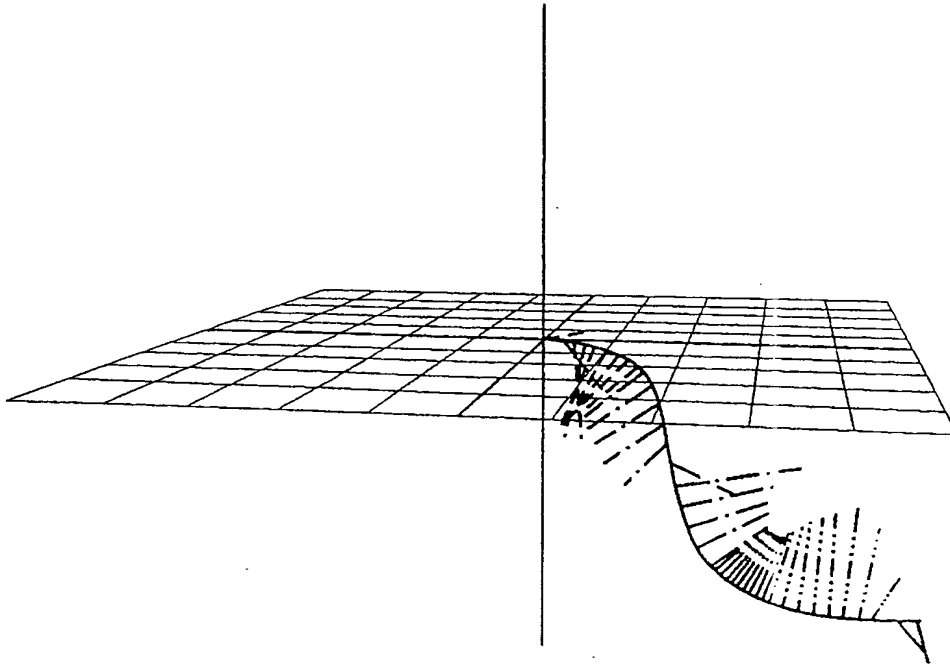


FIG.72

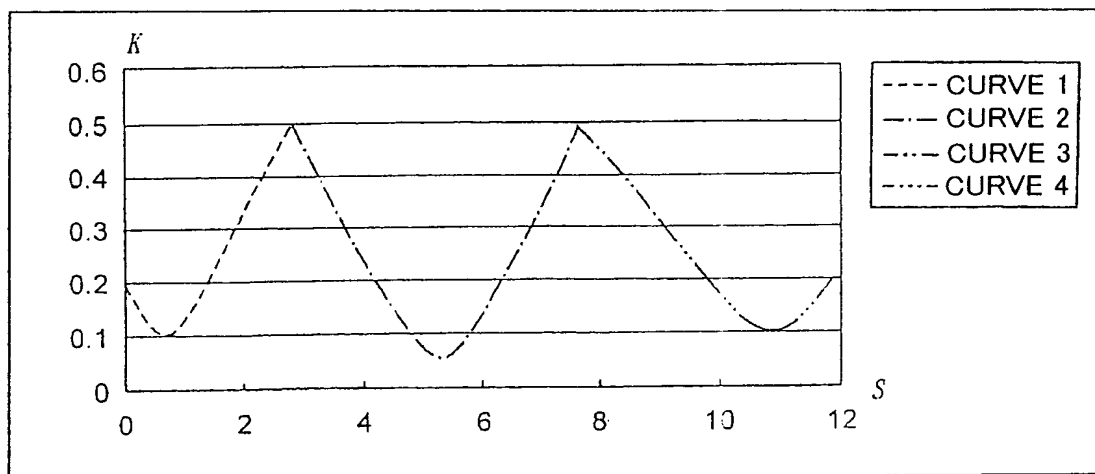


FIG.73

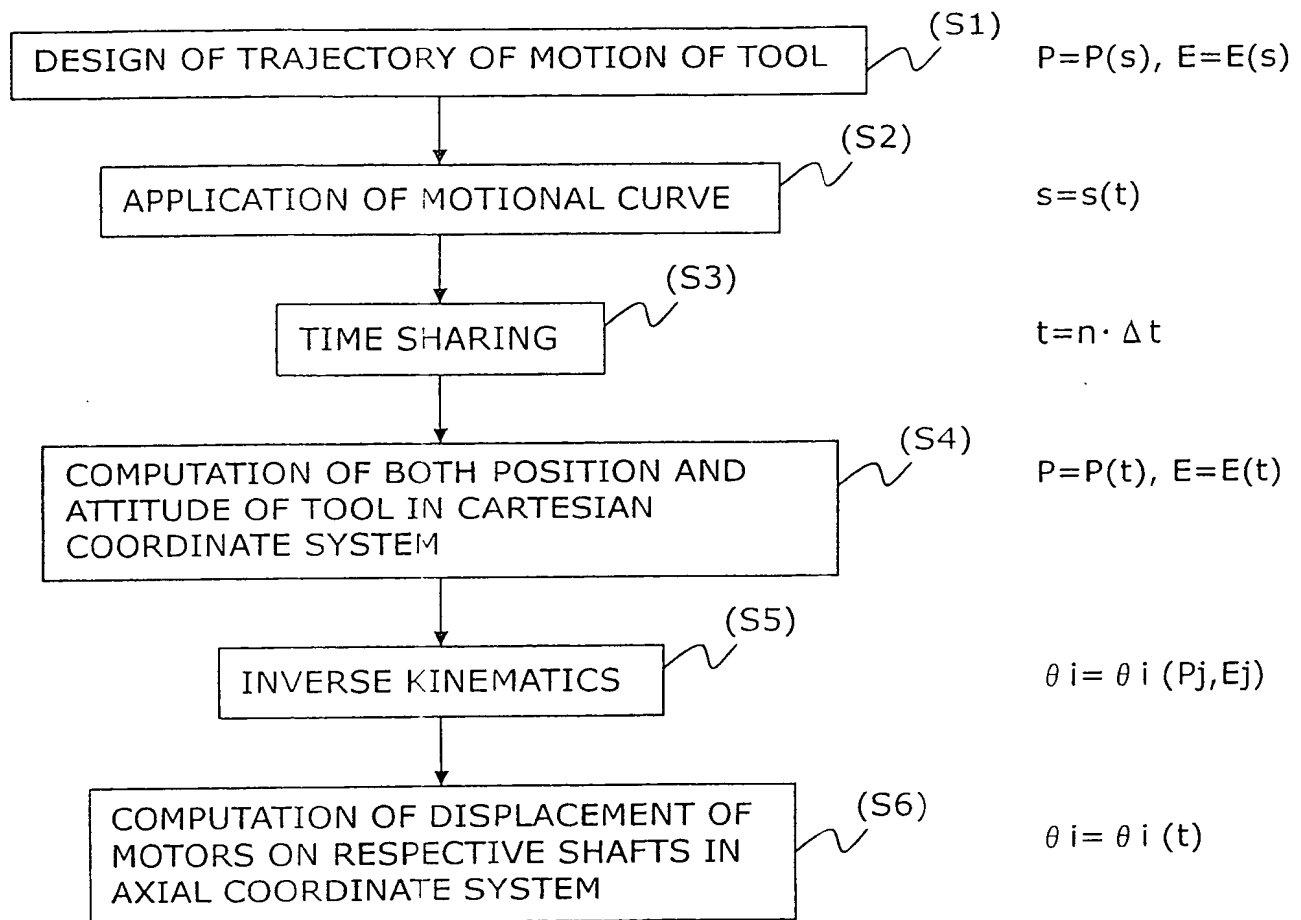


FIG.74

